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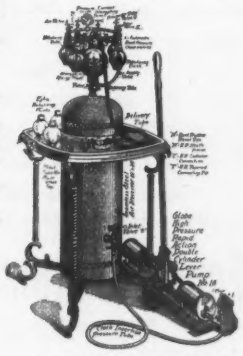

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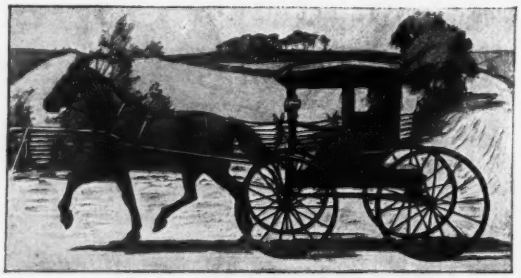

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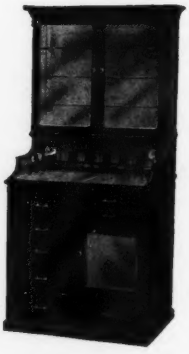

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MEDICAL EDUCATION—PAST, PRESENT AND FUTURE*

By J. A. WITHERSPOON, M.D., Nashville, Tenn.

Fellows of the Mississippi Valley Medical Association, Ladies and Gentlemen—One of the duties of your President before retiring is to make an address on some subject of interest, both to the members of the society and to an audience of both laymen and medical men.

In selecting the subject of medical education I have done so believing that nothing can be of greater importance than the thorough preparation of those desiring to enter a field where the health, happiness and prosperity, even life itself, will be constantly in their keeping, both to the men with whom they will be associated, and the people upon whom they will practice their calling.

The people of this country have a right to expect the best talent that modern medicine can afford, and if we are to maintain a high standard of proficiency none but doctors of high character and broad intellect should be permitted to enter a field of labor, having such grave responsibilities as that of the practice of medicine. The only hope that such men alone will be permitted to enter and assume these responsibilities is in the right of the people to demand of their respective States the passage of such laws as will control the practice of medicine and the appointment of only honest and well equipped examining boards, clothed with sufficient legal power not only to deny license to the unworthy, but to suppress schools not complying in every particular with the demands of modern medicine.

The early history of medicine, while as old as civilization itself, was so mixed with myth, fable and superstition as to be of little value except from an historical standpoint, yet for all time honest and sincere men have spent their lives in that beneficent calling which would add to the protection of the health and longevity of the human race.

One of the greatest barriers to the development of medicine in the past as a science, especially in that early period, was its close alliance with religion and the priesthood, and while I say it with no irreverence or reflection upon either religion or the church, the progress of medicine was seriously retarded for many centuries by the mistaken ideas which dominated the heads of the great religious callings in that period, and it is but a truism to state that it was not until medicine was divorced from the church with its soothsayers and priests that it made any perceptible progress along scientific lines of research.

The Egyptians, many centuries before Christ, embalmed their dead by filling the various cavities with spices and aromatics and wrapping their bodies with many layers of fine linen covered with some resinous substance, which preserved bodies longer than any method known at the present time; in addition to this, we find them with a treatise on medicine called "The Sacred Book," which was in the hands of the priest alone, but which, at least though fallacious and narrow, showed a sincere desire to combat the ills of mankind according to the lights before them; and while ignorance and superstition so beclouded the medical atmosphere of that day, so as to render it ridiculous in the eyes of our present knowledge, yet it illustrates the

*Presidential address before the Mississippi Val-ley Medical Association, St. Louis, Mo., Oct., 1909.

fact that in all times medicine has been placed in the hands of educated and intelligent men of their day.

Even the Chinese, led by Hwang Ti, one of their kings three thousand years before Christ, wrote very exhaustively upon medicine, and while his theory that the pulse was the true indicator of the system and divided into the supreme or celestial and the inferior or terrestrial spheres, thus adopting one of the most variable of the functions of the body upon which to base its deviations from the normal. Indeed, a student of the early history of our profession, while being amazed at the ridiculous and misguided theories of that time, will be impressed with the characteristic earnestness and sincere effort to benefit the human race, which has signally been the slogan of medical men for all times. In the writings of Moses we can read his laws of hygiene and sanitation with great benefit in the light of our present knowledge. It is of exceeding interest to note through all the past ages of ignorance, necessarily surrounded by the superstition of those days when the soul was believed to be in the heart and life itself depended upon some ethereal substance intangible but God-given, how many sparks of truth have been handed down to us notwithstanding the uncertainty of any history written during that mythical period of human existence. Hermes in Egypt and Esculapius in Greece and their followers were the medical authorities, and by their extensive writings on medicine influenced and practically controlled the entire medical practice of the world down to the middle ages, at which time we find the first schools for the teaching of medicine organized at Salerno and Mont Pelier. It would not be fair to state that medicine had received no benefit by or through the establishment of these schools based as they were upon the knowledge gained through the writings of men of those times; when one considers that Hippocrates long before the Christian era classified internal diseases into acute and chronic; described sporadic and endemic infections, and wrote intelligent articles of great use at that time upon various forms of fractures, dislocations and surgical dressings; following in his footsteps, Galen for the first time dissected human bodies and introduced vivisection; thus, in that early day, laying the foundation of a medical education based upon the fact that to know medicine one must understand anatomy and physiology.

Indeed, it is difficult to say how much the medical world lost when Caesar burned the great Alexandrian library, containing, as it did, many thousand volumes, which would have been of great interest historically, if not of much value from a medical standpoint; because this library contained the writings of Plato, Celsus, Aristotle and many other men of giant intellect who had risen above their fellows. Dissection, so early introduced and regarded as the fundamental basis of their medical education, after the destruction of this library fell into disuse, because of the religious superstition as well as the promulgation of the religious law making the punishment of death upon any who in any way disfigured the human form. These Christians were more zealous in forbidding the only means by which an intelligent knowledge of medicine could be gained than their pagan fathers many centuries before them.

From this Alexandrian period the only historical connecting link has been handed down to us by the Arabians, who kept the art of medicine alive from the ninth to the twelfth century, when we find the Jewish clergy monopolizing its practice. To Charlemagne we owe the organization of the first medical school in 1180 at Salerno, who placed its teaching in the hands of the Benedictine monks, thereby lessening its broad usefulness by again mixing it with theology. But in the twelfth century King Frederick II had laws passed governing the entrance requirements and preliminary qualification for the study of medicine, an example which, though neglected for many centuries, has grown in importance and is now one of the principal advancements of present medical teaching. Indeed, during the period of the Rennaissance all

knowledge underwent a wonderful awakening; instruments of precision were invented, and intelligence and reason triumphed over ignorance and superstition as they had never done before. Hospitals were built and Vesalius again revived the study of anatomy by dissection of bodies of the enemy during that war-like period, often following in the wake of battle to get his subject; dissecting his subjects in secluded places he rapidly drew around him a body of men brave and enthusiastic, who were determined to pursue the study of medicine even though their lives would pay the penalty should they be discovered.

Fads in medicine seem to have been revived by Mesmer, who realized that peculiar trait of the mind, and which even until this day permits fadism and humbuggery to live and thrive. Thus, in the last century, when bleeding was the *sine qua non*, many precious lives having been sacrificed upon the altar of medical science, and in the year 1833 in France alone 41,500,000 leeches were imported and used in the treatment of all internal disorders. Any advance in medicine has always been received with suspicion, like the discovery of vaccination by Jenner in 1796, but following that etiological period of ten years from 1880 to 1890, when the cause of so many infectious diseases was determined, a new light was thrown on many hitherto unknown problems, and we are to be congratulated upon the life-saving laws of preventive medicine, which today is the bright particular star around which all advancement in medical science must center, and the day has fortunately passed for the animal magnetism of Mesmer or the use of the Oriental tom-tom to drive away the evil spirits which were thought to be responsible for all disease. And, judging the future by the past, homeopathy, eclecticism and osteopathy will disappear before the calm reasoning of growing knowledge.

Up to a few decades ago, as has been suggested, it required a supreme faith upon the part of both the doctor and the patient to accept the conglomerated mass of empirical ideas handed down from a rather hazy past, but today we recognize medical limitations and accept scientific data which in its accumulative certainty stamps medicine as a science and preventive medicine as truly the highest and grandest advancement made by any science of modern times. This and the marvelous progress of modern surgery is quite sufficient to command not only the admiration of mankind but the everlasting gratitude of suffering humanity.

Since 1765, when the first medical school was organized in this country, each year has brought its advancement both in equipment and curriculum until it is safe to say that while medical teaching, as a whole, in the United States has not been satisfactory and entirely too many schools exist, yet, out of the 160 medical schools of this country, a number of them are the equal both in equipment and teaching facilities of those of any school of the old world. Indeed, when we consider that the schools of this country have been entirely without financial aid from either individuals or State appropriations, it is to the everlasting credit of medical men that so much has been accomplished by individual effort, handicapped by lack of funds. Up to twenty-five or thirty years ago, nearly all of our schools had a two-year course of four or five months duration, and while far from being satisfactory, they were the product of a new country with a wide expanse of territory; in many cases the teaching was extraordinary, coming as it did from men of strong intellect and high character, advancing both in length of term and in instruction as rapidly as it was possible for a people who had just won their independence by a long struggle with the mother country and then had to spread civilization by defeating a cruel savage race before they could extend civilization in any territory with safety. One has but to study the history of his own country to realiez the great difficulties surrounding our forefathers in medicine, to understand what barriers confronted them in their efforts to establish a medical foundation in this country upon which to build the

present grand and glorious structure; and when we consider that in a few years all schools have gone into a four-year graded course, the better ones demanding strict educational qualifications to enter the study of medicine where a well-equipped chemical laboratory has taken the place of a few chemical experiments by the teacher of chemistry; and the awakening of the present interest in all laboratory work so necessary to the thoroughly equipped medical man of today, thus teaching the chemical, physical and vital laws which govern health and pathological changes as well as minute histological and pathological findings made plain and possible alone by modern laboratories supplied with instruments of precision and thus unfolding many problems practically unknown and unrecognized without their aid.

It is to be regretted that the majority of medical schools in this country, up to a few years ago, were private enterprises, many of them for revenue only, and doubtful professional honors, and while this is true at the present time in some sections of the country, thanks to the exacting demands of modern medicine and the higher ideals of a more intelligent profession, aided by State laws and examining boards, these schools are rapidly passing out of existence, until it is not too much to hope that within the next few years all of the medical schools will have connection with some university and receive the necessary endowment which is alone lacking to bring them up to the best schools in the world.

In nothing has greater improvement been shown than in the personnel of the students of medicine of today; indeed, it requires men of broader culture and better trained minds to understand medicine at its present standard than ever before; and the day is not far distant when philanthropists, States and municipalities will freely give to the upbuilding and perfecting of schools for the dessemination of medical knowledge. Time is ripe for men of wealth to realize what a debt of gratitude they owe to modern medicine and to encourage its advancement by furnishing the means necessary to establish schools of high standing in sufficient numbers in every section of this Union. One of the best evidences is the widespread establishment of preparatory schools in which young men receive preliminary education sufficient to enable them to understand and digest the medicine of today, requiring, as it does, higher mental training than a few years ago, to which should be added a certain amount of scientific work, such as chemistry, physics and biology, which would be of great advantage to them in the proper understanding of a scientific course in medicine as given in our best schools at the present time. Can wealth be better distributed or bring greater returns than by educating young men not only to properly care for the sick but perfect them in the great laws of preventive medicine by which epidemics, as cholera and yellow fever, have been forever driven from our country, where they in the past not only claimed many victims but paralyzed commerce and trade and cost incalculable amount of wealth as well as the disorganizing of business. Nothing can be truer than the old axiom, "Health makes wealth," and the crying necessity of the day is for the distribution of wealth in the channels of medical teaching and hospitals, wherein young men can be prepared in the science of hygiene, sanitation and preventive medicine. What man of health does not owe tribute to the labors of modern preventive medicine, which has not only driven all of these epidemic scourges from our land, but is now in a death struggle with that fell destroyer of mankind, consumption, claiming, as it does, one-tenth of the population and feeding upon the young, who are the active wealth producers. Again, who can estimate the good that is being accomplished by municipal sanitation, which is furnishing pure water and wholesome food with healthful surroundings, thereby lessening typhoid fever and many other infectious diseases, all of which are not only life-saving, but wealth-producing forces.

Why are we behind Europe in medical training? I answer only because their schools

are under direct supervision of the government and receive financial aid from that source as well as from many of her rich philanthropists, making it possible for them to demand proper preliminary training before entering the study of medicine, as well as having their schools independent of the fees of the students; practically all schools are entirely under the control of the government of the various countries of Europe.

It is rather startling but true that we have more schools in the United States than all of the combined countries of Europe; this, of course, is unfortunate, and I think every one will admit that of the 160 schools now in existence, from fifty to sixty are quite sufficient, and that the entire medical profession should combine in one grand effort to promote consolidation and do away with all schools of low standard and improper facilities for teaching. This can only be accomplished by rigid State laws and capable men on State examining boards, who will give a thorough but practical examination to all applicants. The people have a right to demand that none but competent men be licensed; and when the people are educated to that point, where they can appreciate the difference between well trained, competent men and ignorant pretenders, then, and not until then, will proper State laws be passed and enforced; and poorly equipped medical schools find their occupation gone and close their doors. If the world knew that some sixty or seventy medical schools in this country have already elevated their standards very materially, requiring not only sufficient education but certain special equipment for the study of medicine, thus enabling them to give students a thoroughly scientific medical course with every laboratory and clinical facility, it would go a long way toward doing away with medical schools as private enterprises, and then it will not be difficult to get endowments for medical teaching in this country as it is in Europe.

And now, in conclusion, this being the largest independent medical society in this country, should go on record as standing for more than social and scientific work in her meetings and stand firmly for medical education in its highest sense of progress, and wield its influence to bring about reforms in medical teaching, by *first* insisting on every State within its territory having uniform medical laws. *Second,* that none but men of culture and strictest integrity be placed on examining boards, and that politics be kept out of all medical transactions. *Third,* that colleges not having equipments to teach modern medicine should be compelled to equip or to retire from the field, and the none should assume the responsibilities of teacher who is not by training and natural talent especially fitted to impart and instruct others. *Fourth,* that no college be recognized that does not insist upon sufficient preliminary education and mind training to receive and digest modern medicine of every student as an entrance requirement, and a standard curriculum, in which full laboratory and clinical facilities will insure that none but good and well qualified men will be graduated. *Fifth,* that all schools give prominence to the teaching of hygiene and sanitation departments, sadly neglected in the past, but in preventive medicine so necessary for the protection of our people from infectious diseases, either endemic or epidemic. *Sixth,* and that we insist upon the fact that colleges must have endowment and that no philanthropy is more needed or deserved, and none will give greater returns, both by insuring the people that none but competent men will belong to our profession, and financially because they will enforce laws which will forever bar the entrance of epidemic scourges into the ports of this, the grandest and most glorious country that was created for the enjoyment of mankind.

THE TRAINING OF THE GYNECOLOGIST*

By HUBERT A. ROYSTER, A.B., Raleigh, N. C.

Professor of Gynecology, University of North Carolina; Gynecologist to Rex Hospital; Surgeon-in-Chief, St. Agnes Hospital.

In recent years gynecologists have been criticized from two opposite points of view. They have been accused on the one hand of doing too little, and, on the other, of doing too much. Under the first count it has been asserted that the gynecological field was narrow, and that the attitude of one who worked in that field was necessarily contracted. The second criticism is aimed at those who have attempted to widen the field and who thereby have brought on themselves the charge of encroaching upon the confines of others.

Whether these criticisms are just or not will now give us no great concern. What interests us particularly is that these two opposing views of an important specialty do exist, and there must be ground on which such opinions are based. No good can come of arguing the facts in the case. But, admitting the contentions, there may be some profit from an inquiry into the reasons for these views and from suggestions in the matter of their avoidance.

It is doubtless true that at different times and in divers places gynecologists have been guilty of the charges made. In many instances they may have failed to take the larger view of the woman, while looking at the womb; or, possibly, removed organs free from permanent lesions and recklessly gone off after distant and unrelated affections. Whenever such things occur and a whole specialty is arraigned for these performances of its followers, explanations are needful. No matter how restricted or how widespread such practices may be, they are due to false conceptions and improper training. By the latter is not meant too little training; too much of the wrong kind is distinctly more harmful.

From its very beginnings, gynecology has been intimately associated with obstetrics. In fact, the necessity for devoting attention to the diseases of women came as a result of conditions produced by childbirth. Gynecology really had its origin in obstetrics—particularly in crude and meddlesome obstetrics. It was a perfectly natural process when those who essayed to go into gynecology approached it from the domain of midwifery. All the older gynecologists were produced in this way—and, be it said to their credit, they left a deep impression on the whole science and art of medicine. As their specialty grew, however, it became more and more evident that marked mechanical, manipulative and operative skill would be required, and only a chosen few developed real surgical instinct. Those who fell by the wayside failed to perfect themselves in technique—failed to see that gynecology must become largely a surgical specialty, and that they could not transform themselves from obstetricians into gynecologists without the proper surgical training. There is a lesson behind all of this. The modern obstetrician should possess surgical instinct and receive surgical training. How long will it take us to learn that obstetrics is really a surgical art? The difference between an able accoucheur and an inferior one is chiefly in the greater mechanical skill of the former.

So with gynecology—it is by the nature of things concerned with factors which demand surgical—*i. e.*, mechanical, manipulative or operative treatment. There are only three original sources of pelvic disease in women, and these are (1) injury, (2) infection, and (3) deformity. The first results principally from childbirth; the second, from venereal and puerperal disease; and the third may be either congenital or acquired. The proper cure of conditions resulting from these factors depends, of course, upon removal of the cause.

*Chairman's Address, Section on Gynecology, North Carolina Med. Soc., Asheville, June 15-17, 1909. Read by title.

An injury must be repaired; an infection must be removed; a deformity must be corrected. Only by surgical means can such ends be accomplished. Hence, we are logically led to the conclusion that the modern gynecologist should be a skillful surgeon, no matter from what field of medicine he enters his chosen specialty.

But it is not all of surgery to cut nor all of gynecology to operate. Rather is it more important to know when not to interfere. Herein lies the matter of greatest moment—diagnostic ability. This comes only through a knowledge of pelvic pathology and a long experience, seasoned with judgment and reason. A gynecological diagnosis consists not in finding this or that one thing out of gear, but in looking first for the etiological factor behind the whole affair, and determining its relation to the lesions and the symptoms. Simple, unassociated affections of the female genital tract are seldom seen. The majority of women coming under observation are victims of a chain of pathological events, originating often from a single cause, but progressing and gathering complications to the point at which relief is sought.

To make a correct diagnosis in this branch of medicine means more than merely discovering the diseased conditions present; it includes also a search for the focal lesion, whether it be a primary or a secondary affection, and a summing up, so to speak, of the elements responsibility for the morbid state of the patient.

Not only must the pelvis be studied carefully, but the whole woman is to be taken into account. To do this successfully, one should be a good physician and all that this implies. No better preparation for the gynecologist is to be found than the experience afforded by a period devoted to the general practice of medicine. It is a well known fact that in the work of the average doctor eight of every ten patients are women. What useful knowledge can be stored up from this material, if every advantage is seized and used! The same may be said of surgery itself. Ashhurst has told us: "The importance, and even necessity, of a thorough knowledge of practical anatomy, can, indeed, scarcely be overrated; yet it is more essential for the surgeon to be well versed in pathology and therapeutics (or, in other words, to be an accomplished physician), than it is for him to know the attachments of every muscle in the body, or all the possible variations of arterial distribution." Most mistakes in medical practice are made through carelessness rather than from ignorance, and, if one wishes to do efficient work and to escape just criticism, one must, especially in the diseases of women, never overlook anything and never jump to conclusions on flimsy evidence. The question has been asked: How much gynecology is it necessary for the general practitioner to know? He should know enough, at least, to be able to make a systematic examination, leading to an intelligent diagnosis. When that is done, the case is mastered.

Ideal training for the gynecologist of the present day would seem, from this meagre presentation of the matter, to come from a sort of trinity of sources. A service as an interne in a large general hospital or a number of years in general practice, with its usual amount of obstetrical work and an apprenticeship as a surgical or gynecological assistant would lead up to proficiency in the practice of gynecology and supply the best possible foundation for future specialization. Obstetrics, general medicine and surgery are the three pillars of gynecology. The first furnishes the bulk of its etiological problems; the second affords help for most puzzling factors in diagnosis; the third presents the means of cure. It is difficult and unnecessary to say which of these is the most important element; they are all essential to a well-rounded knowledge of the subject. And a good gynecologist is made, not born.

THE TREATMENT OF PUERPERAL ECLAMPSIA BY CAESARIAN SECTION

By DANIEL L. MAGUIRE, M.D., Charleston, S. C.

The subject of puerperal eclampsia is very interesting from many viewpoints. The various theories in regard to the etiology as well as the varied symptomatology might be discussed with benefit; but I propose to investigate only the treatment which I believe after all, is the most important part of the subject. When we consider that in this condition the mortality of the mother ranges from 20 to 30 per cent (some observers placing it even as high as 50 per cent) and the mortality of the foetus from 50 to 60 per cent, we can readily see that it is one of the most fatal of obstetrical complications and one that demands our earnest attention. And indeed to my mind this frightful mortality has been due in no small measure to the unfortunate delay caused by dallying with internal medication. I believe that the day when we employed catharsis, diaphoresis, diuresis and veratrum viride on an eclamptic patient is past or should be past. When a woman has had even her first convulsion, then is the time for drugs past and no expectant treatment should be considered. The first convulsion should be the signal for us to empty the uterus, and do so just as quickly as possible. And this mode of treatment is by no means rash or bold when we consider the generally accepted theory of the etiology of eclampsia-foetal metabolism. Surely if we believe that this condition is caused by a toxemia originating from the foetus in utero, then we needs must remove the source, which of course is the foetus, if we would cut off further supply. It seems to me absolute folly to sweat and purge a patient and at the same time allow the source of the trouble, still continuing to generate poison for the mother, to remain undisturbed. So that I am of the opinion that the expectant plan of treatment in true eclampsia should be entirely abandoned, and that this condition should be met in the first place by the rapid emptying of the uterus. Nor am I alone in my judgment. Edgar says that careful observations seem to show that danger is essentially passed in about ninety per cent of cases, immediately after the uterus has been emptied, if this is accomplisehd *early in the seizure.* Again, as far back as September, 1896, the International Congress at Geneva decided that according to the best authorities the uterus should be emptied *as quickly as possible after the onset of eclampsia.*

Believing then that the rational treatment of eclampsia is to deliver the patient at once, it is my purpose now to investigate the respective merits of high forceps and Caesarian Section as the operations most frequently employed in accomplishing rapid delivery.

And in reaching correct conclusions, we must take into consideration the mortality and morbidity of both the mother and the child. Heretofore entirely too little attention has been paid to the life of the child and too little attention to the morbidity of both the mother and the child. This is a question not only of motherless children but a question also of invalid mothers and idiot children. We should not be satisfied that the mother has survived the labor; nor should we congratulate ourselves that the babe as well as the mother is alive. We should endeavor to conduct the labor so that neither shall be harmed thereby. We needs must employ that method of delivery which is safest for both mother and child as well as the one which offers the least likelihood of maternal or foetal morbidity.

Perhaps high application of forceps has been used oftener in puerperal eclampsia than in any other obstetrical complication, and with

very good results as far as maternal morbidity is concerned. And to my mind, this operation has maintained its stand because all along we have been satisfied with having gotten the mother through the labor safely—forgetting entirely the large foetal mortality and morbidity and the subsequent maternal morbidity. As regards the injuries to the mother, we must remember that lacerations of considerable extent may occur in the cervix with more or less hemorrhage. Again, a portion of the cervix may be grasped in the forceps and torn off during extraction. The vagina, too, is very likely to be severely injured. The posterior fornix may be perforated and various lacerations often follow the use of forceps. The perinaeum is frequently torn and gives rise to so many troubles in later life. Acquired stricture of the vagina may follow forceps injuries. The high forceps operations may occasion perinaeal paralysis through compression of the lumbo-sacral nerve as it crosses the pelvic brim; and among injuries to the bony pelvis which thus originate may be mentioned: Dislocation of the coccyx, rupture of the symphisis and loosening of the sacro-iliac synchondroses. Finally, we must remember that there is much atony of the uterus after forceps delivery, with great likelihood of hemorrhage.

So that we can readily understand that the operation of high forceps is not without serious maternal morbidity, and the dangers which I have mentioned are by no means rare but occur very often. Then, too, in regard to the foetal injuries may be mentioned: Asphyxia, caused by pressure of the blades; apoplexy, with its train of birth palsies; injuries of nerve trunks, causing especially facial paralysis, and depressions and fractures of the cranial bones.

Dr. Miles F. Porter, of Fort Wayne, Indiana, in his study of a large number of high forceps operations gives the maternal mortality as 1.14 per cent, the foetal mortality as 17 per cent. While from these same cases, he gives a serious maternal morbidity of 42 per cent and a serious foetal morbidity of 12 per cent.

And now I come to the discussion of Caesarian Section as the operation of choice in puerperal eclampsia. The time was, when Caesarian Section was performed only on dead or dying women in order to save the child, but no one dared to extract the child of a woman in good condition by abdominal section until about thirty years ago. From 1876 to 1886 the operation fell into disrepute on account of its being improperly performed, and so causing a high mortality. To-day, however, Caesarian Section is an important obstetrical operation and is being performed more and more by the best obstetricians and gynecologists in the treatment of eclampsia, and I propose to show why high forceps is gradually giving way to Caesarian Section.

A very important factor, I think, in the treatment of eclampsia, is the time consumed in emptying the uterus. This is emphasized not only on account of the fact that the longer the delay the more poison is thrown out into the maternal system, but also on account of the shock of the operation. In the application of high forceps, we may not only have to perform version in some cases, but in every case we must dilate the cervix, apply the blades and extract. The time spent in adjusting the blades to the foetal head and extraction may be considered as little but forcible dilatation of the cervix consumes in some cases, an hour or more. According to Edgar, it requires from forty minutes to one hour and a half to completely dilate the cervix. So that on the average we are justified in saying that a high forceps operation consumes between fifty minutes and two hours in its performance. Caesarian Section, on the other hand, requires no dilatation of the cervix and no adjusting of forceps blades. All this time is saved. From the best authorities I gather that it consumes from eight to fifteen minutes to get down to the uterus and extract a child by Caesarian Section, and the entire operation takes only about forty minutes in the hands of on ordi-

nary operator. Hence by the performance of Caesarian Section, there is saving of from forty minutes to one and three quarter hours; and in eclampsia when every moment counts, when it is of the utmost importance for the mother and foetus that delivery be performed as quickly as possible, we needs must lean towards Caesarian Section as accomplishing this object decidedly more rapidly than high forceps.

I dare say, however that the strongest point in favor of Caesarian Section and the one that impresses us most when we consider it, is the fact that the mortality and morbidity of the mother is almost nil. Unless the mother is weak and exhausted from many convulsions or infected from repeated vaginal examinations, we can almost always offer a favorable prognosis. If the woman is operated on early, which I have tried to show is always indicated in eclampsia before she is exhausted and before infection has occurred per vaginam, then the danger is not any greater than in an ordinary laparotomy. In the morbidity following Caesarian Section may be mentioned Adhesions to the anterior abdominal wall and hernia, both of which are unimportant.

So far as concerns adhesions, it may be said that because of the size of the uterus immediately following delivery, they are more likely to form between this organ and the abdominal wall after Caesarian Section than after any other operation save ventro-suspension or ventro-fixation, but that troublesome adhesions are likely to form, there is no reason to believe.

In regard to the danger of hernia, I will say that from what I have collected from the accumulated experience of competent operators, the danger is small.

Dr. Miles F. Porter, whom I have quoted above, in his large series of cases, gives in Caesarian Section a maternal mortality of 1.58 per cent as compared with a maternal mortality of 1.14 per cent for high forceps. He also gives in Caesarian Section a maternal morbidity of 13 per cent as compared with a maternal morbidity of 42 per cent in high forceps. This same observer states that the foetal mortality and morbidity in Caesarian Section is practically nil while in high forceps the mortality is 17 per cent, and the morbidity of the foetus, which, in many cases, is worse than death, is 12 per cent.

Now it is by no means difficult to understand that these figures are decidedly in favor of Caesarian Section. Whereas, the mortality of the mother may be slightly lessened by high forceps, her future welfare and usefulness as well as the life and usefulness of the child is distinctly improved by Caesarian Section. And, indeed, every day the maternal mortality by section is being lessened because we are operating early, before shock or infection has occurred.

Perhaps I can do no better than quote briefly the opinions of some of our most prominent obstetricians and gynecologists on this subject.

The Mayos says: "That Caesarian Section done under favorable circumstances by competent operators should give practically no mortality nor morbidity."

Hirst says: "As between high forceps and version in primparae and Caesarian Section, the expert abdominal surgeon would get the best results with the last, even though he were also an expert in the other operations."

Newell, of Boston, says: "In the first place the elective operation (Caesarian Section) done before labor, in the absence of complicating disease, with the patient in good condition, is, in competent hands, *a safe surgical procedure*, and I believe the morbidity in these cases is very slight and certainly very much less than could be claimed for the ordinary obstetrical operation in the same class."

De Lee thinks that Caesarian Section ought to have a wider field and should replace many of the brutal forceps and version operations.

In his last edition of "The Practice of Obstetrics," Edgar speaks as follows:

"The prognosis in Caesarian Section is yearly improving. I am unable, however, to give statistics that will cover all the different varieties of cases. We can state, however, that when the environment is favorable, when

conveniences and competent assistants are at hand, when the mother is in good condition, and has not been infected by repeated examinations and unsuccessful attempts at delivery, and when the foetus is still strong and healthy in the uterus, the danger of Caesarian Section to the mother is almost nil and we can assure the patient and her family that the child will almost certainly survive."

Dr. John O. Polac in the American Journal of Obstetrics, February, 1908, in a series of eleven cases shows that the trend of modern Caesarian Section is to almost perfect results in early cases. He shows also that it is taking the place of sympisiotomy or pubiotomy, high forceps and version, and is being accepted more and more as the treatment of placenta, previa and eclampsia.

"Such results as those recorded by Reynolds of cases of Caesarian Section known to him personally in which there were thirty recoveries in thirty cases, must encourage us to perform this operation more frequently than we have been accustomed to do in the past."

"Again Zweifel has had seventy-six conservative Caesarian Sections with one death. The patient that died was septic when operated upon, and therefore should be excluded in estimating the mortality of Caesarian Section. Hence in Zweifel's hands, the operation has been without mortality.

In this paper, I have endeavored to show that eclampsia is a condition demanding rapid extraction of the child, that Caesarian Section accomplishes this more quickly than forceps, that the mortality and morbidity of the child is distinctly lessened by Caesarian Section—being reduced almost to zero, that injuries to the mother is considerably diminished by this operation and that Caesarian Section is being employed to-day by the best obstetricians and gynecologists in place of forceps.

Its simple technique, together with its absence of brutality, its directness of attack, together with the smoothness of convalescence and *its constantly bettering statistics* all commend it as one of our most satisfactory obstetrical operations.

HYSTERECTOMY*

BY RICHARD A. BARR, M.D., Nashville, Tenn.

I shall not attempt a tedious recital of the various pathological conditions for which the operation of hysterectomy may be performed, but rather shall undertake a brief sketch of what we may hope to accomplish by the operation for the relief of pelvic pathology, to consider what the immediate and remote results may be upon the female organism in the way of mortality, morbidity, etc., and finally to make a few practical suggestions as to the technique.

For the purpose of this sketch we shall exclude the consideration of malignant diseases, as there can be no question as to the necessity of hysterectomy as a life-saving operation for malignant disease of the uterus in cases not so far advanced as to be hopeless.

Patients who come to us expecting relief from operation upon the pelvic viscera we shall divide into three classes. First, those with readily recognizable pelvic pathology which in itself demands surgery (I wish to state right here that I do not include uncomplicated retrodeviations of the uterus in this class), and with little or no evidence of instability of the nervous system. Second, those cases with pelvic pathology of a surgical nature who have decided nerve disturbance. Third, those with a long train of symptoms mainly of a nervous complexion, so to speak, in whom we find on pelvic examination no laceration, no new growth, no positive evidence of infection, nothing except possibly a retro-deviated uterus, a prolapsed ovary, or may be merely pelvic tenderness with organs apparently normal in size and location, and yet the patients themselves are convinced that the trouble is of pelvic origin.

Among the first class of patients, in all conditions where the uterus itself is involved (in uterine fibroids, in uterine infection of any type, in uterine sclerosis and fibrosis, in uterine prolapse, etc.), we find hysterectomy, supplemented by colporrhaphy and perinerorhaphy in appropriate cases, and nothing short of hysterectomy, entirely satisfactory for the *permanent* and *complete* relief of symptoms as well as for removal of the disease. And further the same is true in bilateral disease of the appendages requiring removal of both ovaries, for the uterus if left behind serves no further function that cannot be provided for through other structures, and will not infrequently prove to be the seat of disease, either present and overlooked at the time of operation or subsequently developed. I wish especially to emphasize the necessity for hysterectomy in infective processes of any kind requiring the removal of both appendages, for there is no way for the surgeon to figure that the uterus is not itself diseased, though it may appear normal to the naked eye, and is not almost certain to give rise to further annoyance if not removed.

In the class of cases just considered, with genuine pathology and sound nervous systems, it has been my experience, and that of all others so far as I can find, that not only is hysterectomy, and hysterectomy alone, satisfactory from the standpoint of permanency and completeness of symptomatic cure of the local process, but the artificial menopause is established almost invariably with insignificant reaction on the part of the patient. The nervous symptoms are mild and disappear in a few months, while the patient's general

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health improves almost from the day of operation.

But, some one objects, in many of these cases by doing conservative work, for instance myomectomy in fibroids, salpingostomy and ovarian resection in disease of the appendages, we may be able to preserve the child-bearing function, or at least the menstrual function, and if not that we may get the benefit of the internal secretion of the ovary.

These last are of such questionable value *per se* that I consider them dearly purchased at the risk of leaving behind diseased tissue, or even by leaving a mutilated remnant of supposed healthy ovarian tissue. When a healthy uterus, and an entirely healthy ovary can be left there can be no question of the propriety of leaving them, but in infective processes we must bear in mind that the chances of leaving such healthy structures are faint indeed. Besides in cases in which this can be done the work cannot properly be classed conservative, as that term is ordinarily used, for the most radical would leave such structures. To repeat, the preservation of the menstrual function by conservation of even a mildly infected or otherwise diseased uterus, or by conservation of a resected or infected ovary, and the preservation of the internal ovarian secretion by leaving in an ovary, even a perfectly healthy one, when the uterus is removed, is in my opinion unjustifiable. The results do not justify the risk for the value of the menstrual function and of the supposed internal secretion of the ovary have never been demonstrated to be of sufficient value to offset the danger of failure of cure of pelvic symptoms.

As to the preservation of the child-bearing function by so-called conservative surgery, I am willing to grant the utmost claim of the advocates of conservatism, which is that pregnancy has followed in 15 per cent of the cases, though this is probably too high an estimate where the ovule must come from a resected ovary, or from an ovary that has been dug out of the enveloping adhesions of tubal inflammation, and where the ovum must be taken care of by a uterus that has been and probably is still the seat of infection. Granting, however, 15 per cent of pregnancies following conservatism, are we justified in advocating this kind of work to our patients?

Personally I have no sympathy with the feeling and belief that magnifies the child-bearing function above every other consideration of a woman's enjoyment of life, and above her health. It seems almost inhuman to me to take the position that a woman should cast aside the consideration of personal comfort for fifteen chances out of a hundred of ever becoming pregnant. Instead of being civilized and Christian this position appears to me to be barbarous and heathen. At least the facts may be stated to the patient, and she may be allowed her own decision in weighing her health against a possible child-birth, and she should not be overawed with advice about her moral obligation to become a mother if possible, and made to feel that her life will be a failure if she does not. When a woman applies to me for relief from suffering I feel no qualms of conscience if, in order to give it to her, it is necessary for me to destroy her chance, which is somewhere between zero and 15 per cent of bearing a child to the man who has often been directly responsible for her crippled condition.

For fear that I have drawn you away from my classification, I will restate that these patients for whom I am advocating hysterectomy, because it gets such admirable curative results locally, and is almost without constitutional reaction, are those with well marked pelvic pathology involving the uterus or both appendages, and with little or no disturbance of the nervous system.

We will now take up for consideration those patients with well marked pelvic pathology, and at the same time pronounced disturbance of the nervous system.

What experience I have had has fortified my belief that in these patients the indications

for hysterectomy are similar to those in the first class, and that the contraindications to so-called conservatism are even more positive. There is more reaction during the establishment of the artificial menopause than in the first class of patients, but the patient's general health and nervous system suffer less from this than they would from the pelvic pathology. In these patients it is essential that all pathological tissue be removed, and I think that in this connection ovarian tissue left by resecting or otherwise mutilating these organs should be classed as pathological. The ultimate complete cure depends often on other factors than the removal of the pelvic disease, but this last is an essential part of the treatment.

In the third class of cases it behooves the surgeon to be extremely careful about advising any kind of operative treatment. Only the inexperienced will promise relief by means of the various suspension operations and ovarian resection. Nothing more futile is done in the way of treatment of real or imaginary disease. Should the question of surgery come up as a last resort, after everything short of it has been tried, it is better to make a clean sweep and remove uterus, tubes and ovaries. There are two advantages in this operation, it leaves nothing for the patient to center her attention on, and removes possible pathology not apparent to ordinary methods of examination or even on inspection of the ablated organs.

Do not let me convey the idea that I believe hysterectomy is indicated in every disease of any portion of the female generative tract. Far from it. In any type of pelvic disease offering a rational hope of relief or cure by constitutional measures or local treatment in the form of douches, tampons, pessaries, etc. I believe this form of treatment should be given a thorough trial in the hands of the family physician or of one who devotes himself to gynecological work not of a surgical nature. A surgeon should not have charge of a patient undergoing this form of treatment as he is almost certain not to do the treatment justice. However, when these measures fail, and an appeal is made to surgery, the patient has as much right to demand a positively curative operation on her genital organs as she would have if her appendix or any other worthless portion of her anatomy was involved. It is my belief that hysterectomy is the only positively curative operative treatment for uterine disease and for uterine displacement. Less extensive operations are almost certain to be only partially, if at all, successful, and this fact should be made clear to the patient. If she prefers the certainty of cure to the possibility of childbirth, she should be granted her choice, and without being made to feel that she is doing something unwomanly. To be more specific with regard to displacements, my opinion is that the majority of them do not *per se* require surgical treatment, but when they do, nothing but hysterectomy will get satisfactory results. When both ovaries are ablated the uterus should be removed as well, and ovarian resection is futile if not mischievous. This is not the place to discuss the indications for ovariotomy and I merely wish to emphasize the fact that in my opinion it is a question of removal of an ovary or of letting it alone. Resection is never indicated. Treat and palliate in every possible way before resorting to surgery, but when you do operate, remove the uterus if it is the seat of disease, and if for any reason both ovaries must come out. It is not my purpose to define when these indications are present beyond urging their positiveness in uterine fibroids and in infections.

The majority of surgeons will, I am sure, agree with me that hysterectomy is the most satisfactory operation they perform upon the female genitalia so far as local and general relief is concerned. We may differ upon sentimental grounds as to the indications for the operation, but not as to its success in getting results.

The mortality of supra-vaginal amputation of the uterus in the hands of an experienced operator is determined mainly by such factors

as local infection or of degenerative changes in the patient's heart and blood vessels, etc. The removal of the healthy uterus and appendages should carry with it very little more risk than the removal of a normal appendix. Hysterectomy *per se* does not result in any severe shock to the patient and the risk of the operation when done is measured by the local and general pathology present, and is not greater than that of less thorough or more conservative work in such cases as admit of argument as to which is indicated.

Pan-hysterectomy requires more time, involves the loss of some blood and demands much more skill for its satisfactory performance than supra-vaginal amputation, and for these reasons it carries a somewhat higher risk than the latter operation. However, the cervix when left behind will sometimes necrose and lead to local infection. It interferes with drainage of the subperitoneal space in some instances, and furthermore may at some future date undergo malignant changes. The cervical stump may keep up a troublesome leucorrhoea unless this is obviated by removing its mucus membrane, which, however, can be easily done at the time of the operation.

For these reasons pan-hysterectomy should always be done unless the prolongation of the operation, the increased manipulation and necessary loss of blood more than offset its advantages in the surgeon's opinion, and this of course must be determined in the individual case at operation.

It is hardly necessary for me to remind you once more that we are not considering malignant disease where of course pan-hysterectomy is imperative if operation is done at all.

This brings us down to the consideration of the technique. My experience is confined to abdominal hysterectomy. The vaginal operation never appealed to me and its advantages are so questionable under any circumstances that I have always considered them more than offset by my lack of experience in that kind of work. A man already trained in doing vaginal hysterectomy may make his choice of measures, but I would not consider the untrained operator justified at the present day in acquiring experience in an operation almost out of vogue.

The ordinary steps of abdominal hysterectomy are too well known to need any repetition here. It is my custom to clamp and divide all pedicles before tieing; to leave the stumps of the infundibule-pelvic ligaments as long as possible, and the round ligaments to correspond; to clamp and tie the uterine vessels between the layers of the broad ligament, avoiding the posterior as well as the anterior layer in order to leave the peritoneum free for subsequent use. I use dry iodized catgut throughout. In tieing the round and infundibule-pelvic ligaments the ligature is passed on a needle from the cavity of the ligament, so to speak, through the superior fold reaching across between the infundibule-pelvic and round ligaments. It is then carried over the ligament and back into the cellular interval through the anterior fold in the case of the round ligament and the posterior in case of the infundibule-pelvic. In this way when tied the knots all lie within the folds of the broad ligament, and the peritoneum is perfectly free right to the side of the uterus. After securing the uterine, ovarian and funicular vessels in this way, in every instance (we are not considering hysterectomy for malignant diseases), I do a supra-vaginal amputation and get the uterus out of the way. If the cervix is to be removed it is so caught with a double velsellum hook as to close the cervical canal. In every case in which the cervix is left in the mucus membrane is caught together with tissue forceps and cored out with a knife. The stump of the cervix when left in is drawn together antero-posteriorly with a continued catgut and we are then ready for the final step of closure of the broad ligaments.

When the cervix is to com eout I next secure the utero-sacral ligament on either side by passing a ligature beneath it on a needle.

This precaution obviates a hemorrhage, which is frequently annoying. The connective tissue anteriorly and at the side of the cervix, which is considerable in amount, is now dissected loose down to the vaginal mucus membrane, and in all bleeding points caught and tied before the vagina is opened. This precaution often saves annoying hemorrhage, for the bleeding points are more difficult to secure with the cervix partially severed from vagina. The anterior vaginal wall is picked up with tissue forceps and opened with knife and scissors. This incision is extended laterally to the side of the cervix. The vaginal portion of which is caught with a velsellum and drawn through the opening. By turning the cervix upside down in this way the attachment of the vagina posteriorly can be severed much more smoothly and satisfactorily. There is seldom much bleeding from the vaginal wall after the precautions mentioned, but if there are bleeding points they should be secured. The vaginal opening is now sutured more or less completely in a transverse direction or left entirely open according to the demands for drainage of the subperitoneal space in the individual case.

The final step of the operation either with or without removal of cervix is closure of the broad ligaments. For this purpose I use a medium sized catgut suture which catches the middle of the cervix, or vaginal wall, as the case may be, posteriorly and from this point runs purse string fashion around the entire circumference of the opening in the broad ligaments. It catches the peritoneum of the infundibulo-pelvic ligament external to the ligature on it, and goes through the round ligament external to its ligature. When drawn taut this suture draws the peritoneum of the broad ligaments together and fastens it with the ovarian vessels and round ligaments to the stump of the cervix or the vagina. In this way the vagina is straightened out and, where there is a tendency to prolapse, given the best possible support from above while it in turn supports the bladder. The septum across the pelvis is restored and the bladder gets its posterior support just as satisfactorily, if not more so, than under normal conditions.

THE TREATMENT OF PERITONEAL INFECTIONS IN THE LIGHT OF THE PROTECTIVE NATURE OF PERITONITIS*

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The verified experiments and observations of Cohnheim leave little room for difference of opinion as to the histologic and physiologic changes which take place in inflammation. Hyperemia, congestion, stasis, diapedesis, exudation, fibrin formation, leucocytosis and death of cells, are changes which none deny. That decided and important physiochemical changes take place in the blood cannot be doubted. There is, however, a wide difference of opinion as to what inflammation is, and why it is, and what it may be expected to accomplish.

The purpose of this paper is to point out the treatment of peritoneal infections, presuming that peritonitis is not a disease striving to overcome the patient, but rather a protective process fighting against the infection and striving to save the patient's life and repair the damage done. This view, however, not being generally and consistently accepted, needs some verification. The older conception of inflammation was that it was a very harmful, destructive process of traumatic, constitutional, or idiopathic origin—that is, its cause was unknown. No less than startling have been the discoveries which have set aside the idea of idiopathic inflammation and have shown that trauma and constitutional conditions play a part largely as they furnish means of infection and render the tissues more susceptible to the infection. Even now, when some form of "irritation," usually—some say always—of bacterial origin is known to precede the inflammation the process is still looked upon as a dangerous, treacherous disease, which is at war with the patient. We are not without authority for the view, which facts seem to sustain, that inflammation is the protective reaction in the tissues to overcome the infection, or toxin, or irritation, and to repair as far as possible the damage done; that it is the body's side of the warfare which takes place. It is the effort on the part of living tissue to evade, neutralize, render innocuous, and eliminate morbid irritation and is therefore an effort on the part of living tissue to conserve the individual at the expense of the infection and possibly at the expense of that portion of the body that falls within the infected area. Temporary or permanent loss of function is expected in the part involved and therefore a process whose primary function is to save, may prove destructive, if its field of action falls upon organs necessary to life.

Gould is an authority for the following: "Inflammation is a term applied to those tissue changes by which irritants are eliminated and which include overfilling of blood vessels, alteration in the blood vessel walls, out wandering of leucocytis, exudation of plasma, and multiplication of cells of the surrounding connective tissue." True! Turning to "periton-

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itis," he says, "inflammation of the peritoneum," and in the light of the above he should say a conservative process through which the peritoneum seeks to gain control of peritoneal infections, but instead he speaks of it as a disease process having idiopathic, traumatic and perforative origin with powers of self-extension.

Warthin says: "Inflammation is a pathological complex, essentially adaptive, protective and reparative process, constituting the reaction of the body cells to injury either direct or referred."

Hektoen says: "Inflammation is the reaction of the tissues to local injuries calling forth protective measures."

Delafield and Prudden are authority for the following: "On the whole the processes involved in inflammation are conservative, and within the limitations which may be set by the varied and changing conditions of injury, tend to maintain the welfare and sustain the life of the individual.

Warthin after quoting many authorities who consider inflammation a protective process, again says: "This confusion of inflammation and pyogenesis is illogical and unfortunate. There is no etiologic entity to which the application of the term inflammation may be restricted. Physical, chemical, and thermal agents can produce precisely the same changes as these even in local infections. On the other hand, infection may occur without inflammation." Inflammation is not the fire; it is the fire department; it is not the epidemic, 'tis the health department; it is not the flood, 'tis the dyke; it is not the wolf, 'tis the watch dog; it is not the cyclone, 'tis the cellar; it is not the army of invasion, 'tis the army of defense; it is not the butcher, 'tis the surgeon. The patient then does not die of appendicitis, typhlitis, salpingitis, peritonitis, she dies of infection in spite of their efforts to save. Countless articles have been written upon the treatment of "suppurative peritonitis." If I were asked how I would treat this condition, in the light of our present knowledge, I would say that I would treat it with profound respect as an agent saving more lives than the surgeon could ever hope to save.

The most approved treatment of so-called "peritonitis" at the present day is based upon the ground that peritonitis is a protective process and should therefore be aided in its efforts and not "treated." Very few writers now entirely ignore the infection, but because the invading forces are unseen, the inflammatory process which is putting up the fight against the enemy is made to appear as the criminal in most literature today; because, as B. Fay Mills says: "Dead men have so incriminated it and have established a precedent." It is as though cholera infection had entered a town and the health department wakes up, drafts new men, rushes them to the infected district, cleanses, isolates, deports, burns bedding and houses, closes schools, churches and stores. Never has this happened, but there have been those who, failing to see the cholera, have said: "Why! what ails this town is the health department. All the damage to commerce is done by them." Peritonitis is the health department in the presence of infection and our text-books and health records are still saying, "this man is sick," "this man died because of an over active health department," when pathologists know that he died of infection in spite of the peritonitis.

The obstetrician and gynecologist have fortunately gotten so far as to drop the term "puerperal fever" and substitute "puerperal infection." The treatment tries to prevent, limit, and eliminate infection. Our present day attitude toward the process which is fighting many of our most deadly infections is going to make poor reading a generation or two from now. The infection is not the fever, not the inflammatory reaction, and is going to be incriminated more in the years to come. In spite of the views of the pathologists the present day attitude of the clinician toward inflammation is shown by the following quotation from recent text-books:

"Inflammations of the peritoneum are the

most important lesions which can affect it, and which on account of its great extent and capacity for absorption are dangerous to the life of the individual." Moynihan says: "Slow operations mean death from shock, imperfect operations mean death from a continuance of the acute inflammation." Again, "In cases of acute peritonitis operation is indicated, firstly, for the purpose of removing the products of inflammation—pus, sero pus—and the escaped contents of the wounded viscera, secondly, for the purpose of removing or otherwise dealing with the organ or viscus from which the inflammation originally started."

Crossen, speaking of cellulitis, says: "It causes an inflammatory infiltration of the tissues." "Like any other lymphangitis, for example, of the arm, it runs a rather rapid course and ends in resolution or abscess formation or general sepsis. The inflammation may, however, extend to the peritoneum." Such views could be quoted far beyond the limits of our time and space. A study of modern works on peritonitis shows inconsistent confusion of the terms inflammation and infection with repeated references to the extension of the inflammation to cause death.

Phagocytosis—how much is due to chemical properties in the blood, how much is due to the mechanical interference of the infection, whether the phagocyte and the germ meet each other in a belligerent mood or whether they are wooed to each other by their chemical affinity, how much of the fight is due to the pre-existing conditions in the blood, and how much is due to acquired properties, how much of harm is done by the germ and how much by its toxins? What is the exact nature of the anti body and antitoxine is not decided and cannot wisely be discussed in this paper. What does interest us is that the whole process of inflammation is a reaction in living tissues against morbid irritation, and seeks to protect the host and repair the damage done. Even those who choose to consider inflammation as a destructive process are compelled to classify some forms of inflammation as "reparative," or "constructive," or "formative."

Keeping in mind then that the microscopic and macroscopic changes observed in inflammation are primarily the results of efforts to protect and repair, let us consider the principles of peritoneal infections. Without going into details as to the amount of surface area and the exact nature of the structure of the peritoneum, let us remember that we are dealing with a large sac normally germ free but closely connected by continuity of tissue with alimentary, respiratory, and genito-urinary tracts, which in health or disease are germ-laden, that it is also connected with more distant structures through the medium of the blood and lymph, and that an opening exists normally between the peritoneum and the genital tract in woman, and numerous opportunities are afforded through acquired openings by reason of traumas or morbid processes. Under certain conditions, too, bacteria are known to penetrate the bowel wall.

While the sources of infection are numerous, the large majority reach the peritoneum through perforations of the intestinal tract or its appendages or interferences of the intestinal tract which allow the passage of bacteria through its walls or through penetrating wounds of the abdomen, or in woman through the genital tract. The source of the infection determines to a certain extent its virulence. For instance, the escape of normal bowel or stomach contents into the abdomen carries bacteria of uniformly medium virulence. Interference with the bowel, however, may develop the same germs into greater virulence. The female genital tract may carry bacteria (gonococci) through the tubes that may be almost certainly counted upon to bring about an inflammatory reaction that will save the patient's life. Through the puerperal genital tract infection occurs which must be looked upon with the greatest alarm. With the presence of bacteria in the peritoneum their capacity for harm depends upon the kind of germ, the virulence of this particular kind of infection, the presence or absence of other traumatizing agents, etc., and, on the other hand, to

the natural susceptibility or immunity of the individual to this particular infection, the ability of the individual to respond with an active inflammatory reaction, the opportunities for the elimination of the bacteria and their toxins, etc. In one instance the infection may be so mild that it is overcome with very little inflammatory reaction, and in another a most marked inflammatory reaction may be required to localize the infection, in another the virulence may be so great that a marked reaction is unsuccessful, and in still another the infection may be so virulent as to cause the death of the patient with very little inflammatory reaction. The following statements by a recent author show one phase of the present day attitude toward peritonitis. He says: "In some cases the peritonitis is so severe that death occurs before discoverable inflammatory changes have had time to take place." The error here is readily understood. From what has been said some might conclude that we should feel encouraged when we find a marked and increasing peritonitis. No, because this means positively the presence and extension of a toxic agent. The body does not multiply and concentrate its soldiers for dress parade. The presence and extension of the toxic material must be looked upon with alarm. Subsidence of the peritonitis means control of the infection. Practically every patient would recover, in fact, would be on the road to recovery if the toxic agent could be eliminated. The difficulty with any treatment or with all treatment is that the infection cannot be eliminated. This is an age of recognition of the body's forces for its own protection, as Morris says. The physiologic age — but even masterful forces meet superior forces and that treatment or absence of treatment which "stands by" to witness the fight between peritoneal infection and peritonitis, must frequently see the infection conquer.

We have passed through the pre-aseptic age when peritonitis was observed, dreaded but not understood. With the bacteriologic age peritonitis was still considered a disease having microorganisms as an etiologic factor. With the age of pathology comes the surgeon who attacked peritonitis as a disease, trying to remove as much as possible, but in doing over much his patients sometimes died, but frequently lived if infection was not generalized. Now we are coming into the age in which the forces of the body are recognized, but the strength of the opposing forces should also be recognized. No infection of the peritoneum is desirable. No infection is so mild or so well controlled that it can be counted conquered or harmless. No factor in the treatment may be safely ignored which will deal a blow to the infection and aid the inflammation in gaining control, and any treatment which eliminates the infection with the least amount of inflammatory reaction is desirable, because peritonitis, while trying to save the patient's life, may create conditions which help to cause his death. With this conception of peritoneal infection and peritonitis it seems that the indications are plain.

1. Peritoneal infections should be prevented by the greatest care in operative work and by the approved use of such means as are best calculated to prevent peritoneal infection from other sources. An infected appendix or one which by reason of kinking, the presence of a foreign body, etc., is likely to become infected should be removed. Pathologic conditions of the stomach, gall bladder, intestines, uterus and tubes should receive proper attention.

2. In the presence of existing peritoneal infection, an effort should be made to discover its origin and further infection prevented if possible. A ruptured appendix, gall bladder, stomach or duodinal ulcer, a typhoid ulceration, a ruptured bladder or uterus, in other words, a perforative source of infection, should immediately be exposed, and, if possible, closed.

3. Easily and safely removable sources of infection such as an infected appendix, a badly infected gall bladder, and, in some instances, an infected kidney, ovary, uterus, etc., should be removed, but when this is done during the acute process it should be done not because the structure is inflamed, but because the source

of infection is being thereby entirely or largely removed.

4. All the physical activity of the patient, massage, peristalsis, etc., that would tend to distribute infection should be avoided.

5. The development of the bacteria in and the distribution of the same from the intestinal tract should be lessened by the removal of gaseous and fluid contents, by stomach lavage, rectal flushings, and, if necessary, as is sometimes the case, by enterostomy during the operation.

6. Whenever and wherever an area of infection can be reached or whenever infectious material exists in the general peritoneal cavity that can be drained, drainage should be established. The tendency of infection is to break down its limiting wall and increase its area. The damage done not only depends upon the virulence of the infection, but upon the area involved. Not only do we get rid of infective material and thereby lessen absorption, but the extension of infection in a dangerous direction is prevented. The benefits to be derived from drainage are not limited to those cases which have a distinct localized abscess with a perfect wall. The patient without the limiting wall is one in greater need of drainage, for an easy exit is thereby established, which goes far toward preventing extension in another direction. Septicemia, without any localization, is benefitted very little or not at all by drainage whether in the peritoneal cavity or elsewhere. The principles which govern the extension and limitation of infections do not change at the end of thirty-six hours. The rule which says that infection around the appendix should be left to run its own course after this time is not based upon any principle of limitation of infection, but is based upon the empiric observation that people sometimes die after operation, at, or after, this time.

We must observe that the patient did not die of the infection drained but of the infection left in spite of the drainage, or possibly as a result of infection spread by reason of overmuch operating. This latter possibility however does not argue for lack of drainage, but for early drainage, careful drainage, counting the infection the harmful agent and the inflammation a protecting wall to be disturbed as little as possible.

The Fowler position undoubtedly has its advantages, in making use of gravity to help in bringing infected media to the point of drainage, and to the lower part of the abdomen which, as has been shown, has less ability to absorb infective material than has the upper abdomen. Gravity, however, meets obstacles to drainage that are met in other efforts to drain—that is, infective material passes through the abdomen slowly and poorly. The most approved treatment of infected or troublesome appendices, the most common source of fatal peritoneal infection, based upon the above principle would be.

1. Removal of troublesome appendices before acute onset of infection.

2. Removal of troublesome appendices before any considerable peritoneal infection takes place.

3. Drainage of a localized appendiceal abscess, with the removal of the appendix if it is easily found.

4. Drainage of the peritoneal infection, with removal of the diseased appendix if easily found, if a localized wall has not been formed. The absence of wall or weakness of wall making drainage more urgent.

5. The treatment of the inflammatory wall as a benign and protective process unless it is interfering with the bowels in a mechanical way when it may have to be disturbed even at the expense of distributing infection.

6. Rest, general and local, emptying the intestinal tract, dilution of the toxins and supportive treatment with salt solution, should be made use of as indicated with or without operative treatment.

The treatment of appendicial and peritoneal infections has arrived at this stage over many stumbling blocks. 1. The etiological factor was not known, and inflammation was considered the disease, then came the discovery of the germs. 2. Germs were looked upon as the

starting point of inflammation, which latter was considered the real cause of the trouble, but the living pathology was not understood. 3. Fitz classical paper showed the appendix to be the seat of the trouble, and numerous pioneers demonstrated that the diseased appendix could be removed. Appendicitis became a surgical difficulty, but the operator was frequently fighting inflammation instead of infection, and many lives were lost. Many were loth to consider appendicitis a surgical difficulty until a large mass or general peritonitis was discovered and this gave a large mortality. Many undertook to say in the beginning which ones would go through the attack without an operation and which ones needed an operation, but this proved impossible. The leaders had well nigh established the fact that appendicitis was a surgical disease, temporary impediments having been furnished by the one case, two case, three case man whose cases all recovered without an operation. The ice bag and castor oil enthusiasts furnished some slight diversion, but the radical work went on. It was found, however, that some septic cases died more promptly after operation. The inflammatory wall was being disturbed.

In 1901 Ochsner brought forth his thirty-six hour limit, leaving to the infection such acute cases as had passed that time, and substituting for operation, rest, stomach lavage, and rectal feeding. These methods had been previously used, but not so persistently and consistently as by Ochsner and no one apparently had thought of substituting them for surgical work in these cases which had reached this limit. This substitution for surgical work then constitutes the Ochsner treatment and was based upon the principle that the inflammatory product is protective, and if left strictly alone is all sufficient. It took into consideration the harmful results of treating inflammation, but it ignored one of the most important principles of dealing with infection, namely, drainage of infection to prevent absorption and extension. This was wrong in principle and bad in practice. It was advantageous, in that it did not disturb the inflammation, but it merely substituted one evil for another as it neglected to take advantage of drainage. I cannot lay claim to any prejudice or personal wish when I say that the principle of draining of confined infection obtains just as much on the thirty-sixth day as before the thirty-sixth hour. It is but following the most fundamental principles of surgery as dictated by the existing pathology and verified by experience to drain the infected area at any time, only that the more critical the patient the greater the need, if a considerable area can be reached without marked trauma or disturbance of inflammation.

The plan of operating upon normal appendices while in the abdomen, of operating upon chronic appendicitis, of operating upon acute appendicitis before the expiration of thirty-six hours, if there is a firm wall demonstrable (and these are all good save the first), but refusing to drain infection from a ruptured appendix after that time, and especially if the patient is not protected by a limiting wall is equivalent to saying:

1. I will save the child from falling over the precipice, when no precipice exists.

2. I will save the child when he is several miles from the precipice.

3. I will save him when he has started toward the precipice.

4. I will save him if a strong wall interposes between him and the precipice.

5. But I will not render assistance if he is about to fall over the precipice, because I have known children to be swept over by a company of dragoons.

6. I will keep the child under observation, and if he lives through the results of the fall I will repair the damage.

A case came under my observation recently: A young man who was in the second day of an attack of appendiceal infection which had extended to the peritoneum. He was seen by a general practitioner upon the morning of the second day, and morphine was administered, and the patient told that he would do well. Fortunately he did not get relief from pain, and Dr. Knotts, one of my assist-

ants, was called. He recognized the condition as one of severe infection of the appendix, and advised operation, and through his kindness I saw the patient toward evening. The patient was in great distress, temperature 102 1-2 to 103, pulse irregular as to strength and rhythm, running from 120 to 160, and at times fluttering. The abdomen was distended and extremely tender. The tongue was red, dry, and in places coated. The face was anxious and pinched. The lips and finger nails were blue, and the patient's skin had a mottled septic appearance. The patient's condition was so bad that an operation promised little, and this opinion was strengthened by the results of a leucocyte count, which was 6,000.

I was very much inclined to condemn him to the rest treatment, but I could not bring myself to believe that I was doing my duty to the patient, inasmuch as he was being overwhelmed by infection, and I could let some of the infection escape. A drainage was decided upon, with or without an anesthetic, with or without removal of the appendixv as seemed best when in the abdomen, but decidedly without disturbance of the inflammatory wall. Accordingly the abdomen was opened, pus and fibrin flakes escaping, a gangreneous appendix was reached and easily removed, no inflammatory wall was found, drainage was established. The patient, although markedly septic, made a decided and continuous improvement from that time.

This brief case report is made for the reason that it is typical, and indicates better than conclusions the course to pursue.

100 *State Street.*

OUR MEDICAL INTERESTS*

By ISADORE DYER, M.D., New Orleans.

It is a privilege to appear before a representative audience composed of Southern gentlemen, soldiers in the service of medicine, gathered together for the first time in this metropolis of the South and in the halls of this ancient institution devoted to medical science. New Orleans welcomes you, and those of us who are living here amidst the shades of the monumental spirits of Richardson, Hunt, Stone, Bemiss, Bruns, Jones and Miles acclaim the occasion as one to be remembered as epochal in the history of medicine in New Orleans and in the South.

In the onward mach of our guild in these United States, the vanguard has been made up largely of those who have been unfettered by either circumstance or opportunity. In the council we have frequently had one of our own to sit, great among the wise men directing the affairs of our profession, but for the few decades just past we have had to look after our people at home.

Prosperity has been slow to perch upon our house tops and our roof tree has enjoyed the benisons of a gladsome and hopeful heart with a scanty purse to build upon our opportunity. But the dead leaves of a sad summer have been buried by the winter of reflection and of toil, and our springtime is at hand, promiseful of a season of harvest and joy.

As the watchman in the night, our profession has stood by, closing each door of menacing danger, and sounding the alarms until the day has broken fair and our rest and our reward are on the way.

We have merited these, but our work is not yet done.

Our people have risen from the ashes of war and of disease; they have harnessed fresh hopes to the yielding soil and have developed fields of energy which have gained everywhere for them the title of the "New South"—as if they had been born again.

We cannot rest at the first applause, but must go on developing our industries and our interests until they are as far-reaching as the ends of the world and as useful as their reaches may be wide.

Our children have been gradually emancipated from the ignorance of their fathers and the school-house grows more and more important as a step towards citizenship; our commercial institutions grow stronger and stronger in their stable relations to the world's marts. Our industrial products are each year in greater demand—*everywhere*. But the medical conditions of our Southland need revision.

Our professional schools are responding to the higher standards and to the needs of meeting them; better trained doctors are bound to follow.

So long, however, as the curse of a half savage race is burdened upon us, the problem of conserving our people and our interests must be before us, to be worked out.

The interest of the medical profession lies here and the future success of the coming generation of medical men in the South rests upon the quickened action of our own selves against the evils of the day.

The government has greatly exploited its intention of investigating pellagra, already the Public Health Service has interested itself—and the object is a worthy one.

Last year it was the privilege of a large

* Annual oration delivered at the meeting of the Southern Medical Association in New Orleans, November 10, 1909.

part of the New Orleans profession to listen to the inspired appeal of Dr. C. W. Stiles to the intelligence of the Southern people aimed at the hookworm disease. He delineated types of those dying and sick with this disease in such vivid narrative that these poor beings were brought to us as if they were dying before us.

The burden of a pioneer was one self-imposed by Dr. Stiles, but he has flashed a mighty beacon of illumination among the medical profession of the South, with a fervent hope that every Southern doctor shall join the cause, not only to save those who are sick and dying now, but to safeguard the coming generations.

It is indeed gratifying to know that philanthropy has responded with an active assistanc in this cause.

The $1,000,000 of Mr. Rockefeller cannot efface the immortal record of deaths from the "dirt-eaters'" disease, but it can aid in the cure and prevention of this disease—in bettering the conditions of the peoples among whom it spreads, and by offering hope to those on the way to a certain end.

It is mere Chauvinism to dispute the presence of a condition proven to exist, and it is a false purpose fulfilled for the press to attempt to discount the importance of uncinariasis in the South. If the evil exists let us fight it, and if a $1,000,000 will save but a hundred lives, it will be well spent.

Dr. Stiles also dwelt on the evils of promiscuous relations among the whites and blacks, a horror which has only started in its evil results.

The negro is a living incarnation of a real Frankenstein, anarchistic in matters of health, breathing the evils of infection and planting the seeds of every possible communicable disease not segregated and wherever his feet lead him. Our schools teach no hygiene, and it is too late when the man or woman reaches the age of average intelligence. We physicians must commence and prosecute the work of education.

Louisiana began the education of her people in sanitary measures over ten years ago. Kohnke's name will always stand for the realization of a modern idea of the mosquito and the abolition of incendiary quarantines in the South.

Mississippi systematicaly is educating her people through the lectures and labors of Fred Mayer, a worthy native of this State, who goes from town to town preaching health and sanitation to the people in the hope that some seed may fall on likely ground.

The like should be the labor of every Southern physician—in his own circle creating a school for the dissemination of a knowledge of health.

The Titan task of eradicating tuberculosis among our people has started, but the movement is not yet strong enough. Everywhere a mere handful of the medical profession is engaged in this labor in a public cause. A more general medical interest may in time awaken the conscience of the State and of the Nation to the needs of this great cause.

Our profession in the South has these problems to solve—sooner or later they will be brought to us and we should be ready.

The mission of any large body of men is ultimately for good, and I take it that the Southern Medical Association has come into being for the purpose of general good.

We need to protect our interests as physicians, arming against the parasites among the under-educated and unscrupulous who follow a prostituted trade rather than an honorable profession. Educate our people to know that pretension is not knowledge. We must more and more find our place as citizens so that we can demand that the righteous needs of our profession are satisfied in institutions, in our schools and hospitals; laws of sanitation and our public spirit ought to have such reward.

The array of names of men of the medical guild who have been martyrs to science, who have filled positions of state, who have added glory to the corona of literary geniuses, all

argue that we of the South should find time to work at idle hours in molding forms for future history.

Citizenship is not incompatible with the profession of medicine, and the wisdom which contact with human nature inculcates must be ripe enough to bear worthy fruit.

There is no greater task for accomplishment in the whole civilized race than that of a successful preventive medicine—but it needs the individual effort of every man who is honest in the practice of medicine.

Most of us today may fall by the wayside without reaching a goal, but by working for it we shall have offered the example to those who follow after us. Our legislatures should have in their halls of deliberation and debate men of the medical profession, pledged to further the interests of the public health until their work shall shine before the people in such a way that the light shall reach far enough to impose an obligation upon the Nation to provide a central bureau where the people of this great republic may receive as much consideration as do the dumb beasts.

Organization has no usefulness without purpose, and unless the gathering of our profession in the South aims at some great object it has failed. The burden of any body of men must be for a community cause, and I take it the highest aim of our profession is universal healthfulness.

When the labors of medical men have resulted in the past one hundred years in reducing mortality rate, in obliterating many contagious diseases, in advancing medical education for the good of humankind, the future of that profession must not be barren of like results.

The public is a self-constituted critic, prejudiced against the profession and clamoring for demonstrated achievement, but the public is like a great child needing to be led into the way of cleanliness, godliness and health. With the spirit of today the public is ready for education, and we owe it to ourselves to go more than half way in the effort to instruct them. When that day comes in Utopia, when the State will care for all its sick, educate, train and keep its staff of physicians, lay restrictions of community obligation to health on all citizens, provide for the prevention of disease by instruction in schools and in the communities of peoples, as well as the means to safeguard the individual, then our labors will have ceased, but until such a dream is realized, we must continue to knock at the door of the Empire of Hygeia, begging the spiritual and economic aid of all to further our cause, always humanitarian in its purpose and conservative in its results.

EXTRACTION OF CATARACT IN THE CAPSULE

By DR. HILLIARD WOOD, Nashville, Tenn.

In the earliest operation for cataract, that of "couching," the lens in its capsule was removed from its normal fossa and displaced downward into the vitreous humor. The immediate results of this operation were brilliant, but after a short time the lens, acting as a foreign body in the vitreous, set up a series of deleterious changes which invariably led to the blindness of the eye.

Following couching the lens was removed from the eye, leaving, however, the lens capsule in the eye. This, by whatever technic it is done, constitutes the long established operation of extraction. To divide the anterior lens capsule and remove the lens itself, but leave the capsule in the eye has been for ages, and is yet, the orthodox method of operating for hard cataract. This capsule left in the eye usually, after a few weeks, becomes opaque and the posterior layer which was not divided then constitutes a gray veil across the field of the pupil and to the extent of its opacity interferes with vision. This opaque capsule is known as secondary, or capsular, cataract. The treatment for this is to divide the opaque capsule—to make a hole in it—so light can pass through to the retina. Various instruments, such as Knapp's knife-needle, have been devised for this purpose, and are used with variable success.

Within our own day, Maj. Smith, of India, has advocated and adopted the operation of removing the lens in its capsule. This plan does away with all the after troubles with opaque capsules. In the Smith operation the corneal incision is made, an iridectomy may, or may not, be done, and then pressure, in a backward direction, is made over the lower third of the lens until the suspensory ligament of the lens is ruptured, and the lens displaced toward the corneal incision, and gradually expelled from the eye. This pressure is made from the outside, through the cornea, and it usually needs to be considerable before the lens is dislocated. I have done the Smith operation but twice yet, although the pressure required is considerable, I am sure good results may be had.

Within the past summer Dr. G. C. Savage has devised and gotten out an instrument for rupturing the suspensory ligament of the lens by pressure applied directly to the lens and capsule. This is a small hook-shaped instrument, with a double curve, and is known as the Savage detacher. After the corneal incision this instrument is introduced into the aqueous chamber, through the pupil and pressure sufficient to rupture the suspensory ligament is made directly on the lens. A marked difference between the Smith method and the Savage method is that in the Smith operation the pressure is made through the cornea on the lens, while in the Savage method the pressure is made directly on the lens. By either method the lens may be extracted within its capsule.

I have used the Smith method twice, and each time with good results. I have within the past six weeks used the Savage method nine times, and in each case the result so far is good. My limited experience with these two methods does not justify final conclusions as to their relative merits. The Smith method has the disadvantage of requiring greater pressure, and the Savage method the disadvantage of requiring the introduction of an extra instrument into the eye. On the whole, my preference so far is in favor of the Sav-

age method. I have adopted this method, and shall continue it until I have cause to modify or change it.

The removal of the cataractous lens in its capsule is a consummation long and devoutly wished. By this method we are enabled to remove immature cataracts where the vision is so far impaired as to unfit the eye for ordinary business. We thus avoid the long and tedious delay of waiting for perfect maturity of a senile cataract. We also avoid the risk of leaving in the eye fragments of the lens cortex with their inevitable baneful influence, and lastly we avoid secondary, or capsular, opacities, with their impairment of vision and the operations, often unsatisfactory, done for their relief.

First National Bank Building.

TUBERCULIN TREATMENT OF TUBERCULOSIS

By O. N. BRYAN, M.D., Nashville, Tenn.

It is not the purpose of this paper to detract from the attention given tuberculosis in the well adapted, routine treatment by diet, hygiene and medicine, but, if possible, to give a general review of the attention and good results that have been obtained by specific treatment, since its introduction by Koch in 1890.

It is well known that since the discovery of tubercle bacillus most all chemicals have been given a trial and proved to be a failure. Brilliant results are obtained by hygienic-dietetic treatment, but if there is any addition that can be made to assist in lowering the mortality then we are all very anxious to grasp it. This is what we have in tuberculin. Tuberculin, like many drugs, when administered wrongly, is very poisonous, but correctly given in proper dilution, and at proper intervals, in selected cases is very beneficial.

Tuberculin has been administered every conceivable way (intravenous, oral, inhalation, dermic and sub-cutaneously). The sub-cutaneous has proved to be the most satisfactory, exact and reliable way, although some good results were obtained in all methods. Lawrason Brown states that "it is of interest to bear in mind that the large mononeuclear cells, which seem chiefly concerned in the process of immunization in tuberculosis, are probably derived from the endothelial cells of the lymph and blood vessels, which are directly stimulated by this method, and stimulated most intensely at a point far distant from the area of infection." There are others who oppose this view and claim it should be injected as near as possible to the focus of infection.

DOSAGE AND INTERVAL.

Tuberculin as a therapeutic agent was practically discarded for many years on account of at first using too large dosage. Many men deserve credit for the remarkable work they have done toward the use of small dosage, but Wright and Denys deserve especial mention for the work they have done along this line. Lawrason Brown (in Klebs on Tuberculosis) says, "The method of administration of tuberculin is far more important than the variety of tuberculin, and he who fails to consider that tuberculin is a most potent poison is a dangerous man."

Every precaution should be taken from the very beginning to avoid reaction, if possible, by giving very small doses, at proper intervals, with a gradual increase. This way reaction may be avoided in most cases, still in a few it will be present. Most care in dosage should be given those patients who have recently had the tuberculin test, a sub-febrile temperature, pronounced pulmonary involvement, nervous temperament or complication of any consequence. Some patients being more susceptible than others, will require the initial dose repeated at intervals of seven to ten days, although most patients will be able to take it regularly every three or four days with gradual increase in dosage. The most important rule, according to Brown, is that too little never injures, while too much tuberculin may provoke a serious reaction and hypersusceptibility. It may also be necessary when we get near the end of the process of immunization and are using large doses, to give it at intervals of seven to ten days, just as in the beginning with susceptible patients in order to avoid the reaction. Having no definite means of determining how much the next dose should be, we can only be guarded by symptoms, as temperature, pulse and general feeling of the patient, together with the reaction

at the site of injection. Of course these exaccerbations of symptoms might have developed in cases that were not taking the tuberculin, but we must give it the benefit of the doubt and be guarded about the next dose and time of administration.

The injections should be given late in the afternoon or evening in order that the physician will be able to observe the height of the temperature as well as the general condition of the patient after the day's exercise. A careful record of the daily temperature, before the beginning of tuberculin (say seven to ten days) will aid very much in determining if reaction occurs.

The "typical reaction" is given as follows: "In a typical tuberculin reaction, usually ten to eighteen hours after the injection, the patient begins to feel feverish (possibly chilly at first), heavy and dull, experiences lassitude and has slight elevation of temperature, often detected in the urine stream or rectum before the mouth. These symptoms are rapidly aggravated, and in a short time the patient feels so ill that he is forced to go to bed with pains in the back, legs and head, which are often severe. The tendency to cough may be increased, oppression may be felt in the chest, and the expectoration may be increased, with a slight trace of albumen or a diazo-reaction, and on the whole the patient is ill. These symptoms persist from eight to twelve hours, and usually on the following day the patient feels a little weak, but otherwise all right. In a few instances the reaction is delayed for forty to forty-eight hours, and in others the rise of temperature is less (100 F.), but persists for several days, while the symptoms may be very severe."

The reaction is well indicated at the site of injection by hyperaemia as well as in certain organs, as in the lungs by increased cough and expectoration, pleurisy and shortness of breath, or tuberculosis of bladder is indicated by increased frequency of micturition. This hyperaemia also occurs in cases of tuberculosis of the larynx, lupus, etc. In cases with these reactions the dose should be omitted for a few days, then begin on a very much smaller one. Hemoptysis rarely occurs during the tuberculin treatment, and is best followed by omission of several doses and a smaller dose when begun. I saw one case that had hemoptysis which did not return after the beginning of tuberculin.

Symptoms caused by the administration of tuberculin in very small doses are rarely seen, but when they do it will begin as a slight headache and this should cause no alarm unless it becomes severe, then the administration should cease for the time being at least. Other symptoms that may be noticed are a rise in temperature, even one-half degree should cause one to be cautious; pains in the limbs, joints and back; malaise, faintness, indigestion, nausea and vomiting. Of course we may have any of these symptoms in cases other than those receiving tuberculin, but according to Brown it is wise to give the benefit of the doubt to tuberculin and be governed by it.

Some forms of tuberculin are capable of giving these symptoms more readily than others, among these may be mentioned old tuberculin and bacillen emulsion. The one symptom that has been looked on as that of intolerance the longest is the rise of temperature about 100 F., but there may be a reaction without rise of temperature.

In all cases before the beginning of tuberculin it is best to keep them at rest and under observation for seven to ten days, keeping a record of their symptoms, and get their temperature to normal if possible or so it is running an even course. We should remember never to give it in case of rising temperature. The temperature caused by tuberculin usually appears in twenty-four to forty-eight hours after administration. This shows the advisability of giving it only once or twice a week. This way an observation can be made all along of the temperature as well as other constitutional symptoms. In some cases there will be noticed an antipyrectic action and one should be guarded against it. In others there is an increased susceptibility especially noted in those

having lately had the test applied. In these the dose will have to be reduced.

In all cases careful records should be kept. Those in which the temperature and pulse remain normal, they gain in weight as well as general well feeling or in cases of pulmonary a lessening of expectoration as well as fewer tubercle bacilli in the sputum, then it can be said they are improving.

FINAL DOSE.

The final dose will have to be determined by the improvement of the individual, susceptibility and amount of tuberculin that has been used. Sahli believes that tuberculin immunity is all that can be accomplished, while Trudeau, Bandelier, Roepke and others believe tuberculin immunity to be of great value and should be the object of the treatment. Some claim that large dosage is not necessary to accomplish this immunity and that it should never be carried to the large dose recommended by some men and believe repeated courses of small doses to be better. Bandelier and Roepke say "the best final dose is one that can be borne without reaction, and not be over 1 mgm." Some men claim the best way to give it is to begin on small doses and increase until slight reaction, then decrease the dose very much and continue with this dose for the rest of the treatment.

There are many scales by which the increase of dosage is carried out. The main object in all is for the initial dose to be small enough. We begin by giving 1-10000 mgm. of bacillen emulsion and repeat every four days, if there is no reaction, increasing 1-10000 mgm. each dose until we reach the tenth dose, which is 1-1000 mgm., then begin on the next higher dilution, which has an increase of 1-1000 mgm. each dose, and the third higher dilution begins with 1-100 mgm., and so on until the final dose will be about 100 mgm. This shown clearly that we increase the dose 100 per cent in going from the first to second dose, and as we increase the dose there is a decrease in the percentage of increase. This irregularity some men obviate by having a certain scale to go by, but as there will be very little trouble, if any, in the incipient cases, then we will only have to be guarded in giving it to the very much advanced cases and reduce the amount given for the first three or four doses out of each ten.

In cases where they cannot be present on the fourth day then it is better for them to come and get it on the fifth rather than the third, and in this way we will come nearer avoiding reaction. Some patients get very anxious to have it given at shorter intervals and larger doses, because they have experienced no ill effects. In case you get in a hurry and give the dose at shorter intervals then you are likely to produce a reaction, which is injurious rather than beneficial. The time required to reach the final dose will be from eight to ten months, and if any reactions occur it will be longer. The trouble we have with patients of the incipient stage is that after they have about one-half completed the treatment they have gained so much over their former condition and feel so much better that they will become negligent about their treatment. Some authors recommend that after you have reached final dose, and had a rest of four to six months, then it is well to begin and carry them through another series.

Denys, in experimenting with human and bovine tuberculins, was not able to agree with C. Spengler, who believes bovine has a superior immunizing power, but found he was able to alternate with large doses, producing no ill effects. Those accustomed to strong doses of one could tolerate strong doses of the other. Most men claim it is best to immunize with the same type as that of the infection.

The selection of patients is an important question, since Koch's idea was to give it to only incipient cases. According to Dr. K. Hammer, of Heidelberg, it may be used in all cases, even as a palliative measure in the hopeless cases. In these he claims it will many times benefit the troublesome night sweats,

increase the appetite, lessen the cough and expectoration and often cause a lowering of the temperature. No doubt the best results are obtained in the cases of the first stage, and now since we have the tuberculin tests as a valuable aid in diagnosis, there is little excuse for a case to reach the second or third stage of tuberculosis, but even if they do reach these stages they can be very much benefited if not cured by giving tuberculin together with other routine measures. In cases with marked general symptoms and far below normal, with a temperature and pulse rate high, it is best to rest them a while before beginning tuberculin. When the temperature runs an even course, even if 100 F., it may be given without ill effects, but it should not be given when the temperature runs a course of 101 F. or more. Brown says, "a persistently rapid pulse, as well as dyspnoea, after a period of rest, is a contraindication."

Under contra-indications are mentioned meningitis, nephritis (non-tubercular), diabetes, cirrhosis, and care should be exercised in cases of marked nervousness, hysteria, neurasthenia and exophthalmic goitre. Koch opposes the use of tuberculin when there are "marked processes" caused by staphlococci, strepto-cocci, pneumococci and influenza bacilli.

Sahli has used tuberculin in tubercular families as a prophylactic dose with marked benefit. There are so many cases of infection take place by one member of a family waiting on another that I think it would be wise to advise these people, after having been around a tubercular subject for any length of time, to be immunized.

In the selection of tuberculin from the many varieties, it will be found that they all have their adherents with reports of good results, but the old tuberculin and bacillen emulsion seems to be the ones given preference by most men. Most authorities agree that there is good to be derived from most all tuberculins, if properly given, with especial care not to get a reaction.

These patients should be instructed, as we have always done, about their diet, exercise and proper hygeine. We should not leave the impression that we have an absolute specific in tuberculin, regardless of all other treatment, any more than we have a specific in mercury for syphilis if they continue a life of dissipation. We should also use the tuberculin tests in cases that cannot be diagnosed clinically in order that, in case they are positive, we may begin tuberculin treatment at the very beginning of the disease.

RESULTS.

Sahli says the results obtained from tuberculin are: "1. Cure (only in the earliest stages). 2. Compensation (equilibrium, the disease neither advances or retrogrades). 3. The disease slowly advances. 4. No results."

Of course we are not to expect much from it in the advanced cases, but when we do derive benefit we are to be congratulated on having done more than could have been done otherwise. There are many interesting statistics concerning those treated with and without tuberculin, all showing more cures and improvements, especially in the first and second stages, with those treated than those not treated by this method. The following is a table by Bandelier and Roepke that shows the percentage of patients that lost tubercle bacilli from the sputum while being treated by B. E. or O. T.:

Stage.	B. E.	O. T.
I.	100%	100%
II.	78%	90%
III.	34%	39%

This shows clearly that they are benefited by losing the tubercle bacilli from the sputum.

I will now give a list of the different forms of tuberculosis treated by us with tuberculin, but will not attempt a classification as to the advancement of the disease. Among those treated were: Lymphatic, 12; bone, 5; pulmonary, 5; testicle, 3; peritoneum, 4; fascia, 3; fistula in ano, 1; kidney, 1; rectal, 1, and hip joint, 1. Of the twelve cases of lymphatic all were cured; bone cases all cured; pulmonary cases, three apparently cured and two improving, still under treatment; fascia

cases, two cured and one making marked improvement under bovine tuberculin. Of the peritoneal cases three of them were advanced cases which died, one in the first stage cured. Of the testicle cases one cured and one improving. The kidney case far advanced died. Rectal case cured. Hip joint case has marked improvement, still under treatment. One of the lymphatic cases that would not react to human, did to bovine and is doing nicely.

These cases that have been cured or made improvement have done so by gaining weight (in most cases), temperature becoming normal and general well feeling. The pulmonary cases were all confirmed by the microscope, the peritoneal cases by operation, and all other cases were confirmed by active tuberculin reaction from the tests.

146 *Eighth Avenue, N.*

REPORT OF A CASE OF TYPHOID FEVER*

By T. E. FULLER, M.D., Texarkana, Ark.-Tex.

Kyle, in his Manual of the Ear, Nose and Throat, says that aural complications in typhoid fever depend upon the severity of the infection, which is due either to the toxins or to the invasion of bacteria from the nasal pharynx. Osler has been unable to detect the typhoid bacillus in the pus from the ear in any of his cases. Otitis media as a complication of typhoid fever has occurred in 2.5 per cent of the collected cases. Serious results are rare, and in Osler's series only one case had involvement of the mastoid. McRea, in his article in Osler's Modern Medicine, states that in his series of cases ostitis occurred as a complication in between 1.5 per cent and 2 per cent of the cases. In some of these cases redness and tenderness was present over the mastoid, but in no case was an operation necessary.

On account of the rarity of this complication, as shown by the literature, I desire to report the following case which occurred during my service at the Cotton Belt Hospital. My thanks are due Dr. C. A. Smith, the chief surgeon, for permission to report the case.

L. Horn, male, colored, age twenty-one, was admitted December 21, 1908. He gave a history of malaise and anorexia with more or less fever covering a period of about a week. On the day of his admission his temperature ranged from 100 to 102 degrees. His family history was good and his previous history negative. Physical examination of the chest was negative. Abdominal examination revealed a slightly enlarged spleen and liver. Urinary findings were about what you would expect in any febrile condition. Blood was negative to malaria. We were unable to obtain a successful widal.

From this time on the patient presented the picture of a typical case of typhoid fever of average severity, temperature ranging from 101 to 104 degrees. The case was managed with all the precautions advised in any infection. The diet consisted of buttermilk and beef juice and egg albumen, the latter diluted or flavored. These were given alternately every two hours in quantities of from four to six ounces. When the temperature was above 102 degrees a cold sponge bath lasting not less than thirty minutes was given. When tympany was troublesome turpentine in 10 minum doses was given and hot turpentine stupes used. Once during the attack the patient complained of pain in the region of the gall bladder, for which urotropin was given and the pain soon subsided. When stimulation seemed advisable, strychnine and whiskey were used. The case was progressing nicely and the temperature gradually falling when on January 4 the patient complained of pain in his left ear, and an the same day a purulent discharge appeared. Dr. Mann immediately saw the case and instituted treatment. On January 13 the other ear became involved. The temperature up to this time had been but little influenced by the complication. On the 17th of January, however, considerable tenderness over the mastoids was noticed. Pain became severe and continuous and the temperature rose to 105 degrees. On January 22, after faithful treatment, the condition continued to grow worse, so both mastoids were drained. The patient reacted nicely; the pain

*Read before the Northeast Texas Medical Society

and tenderness subsided and good drainage was maintained. For several days the patient improved, and it seemed that he would recover. After this, however, the temperature rose and the patient sank into a typical typhoid state, with low muttering delirium, coma-vigil and all the severe nervous symptoms incident to a profound toxemia, from which he died February 2 at 8:00 p. m.

I shall not attempt a detailed report of the autopsy, but desire to call your attention to the following facts:

First.—The meninges and brain of the temporal lobe in the region of the mastoid were normal, as was the entire nervous system, including the cerebro-spinal fluid.

Second.—Healthy ganulations lined the mastoid; no pus was present.

Third.—A mild peritonitis in the terminal portion of the ilium, the caecum and ascending colon. A careful search showed no perforations, and no ruptural mesenteric glands were present, so this peritonitis must have resulted from a direct extension of inflammation through the wall of the interline.

Fourth.—The pericardium contained a large amount of fluid, which is rare in this condition.

Osler, in the Nothnagel Volume on Typhoid Fever, says: "Although in the minority of the cases examined anatomically by Romberg, small cell infiltration of the capillary walls and of the smallest vessels of the deeper layers of the pericardium were present, these presences rarely attain such an intensity as to give rise to the clinical symptoms of pericarditis, and I have observed fluid pericarditic effusions only with extreme rarity." Dock, in the Nathnagel volume on Heart Diseases, states that pericarditis, as a sequel of typhoid fever, is rarely ever seen.

We deem the association of these two rare complications in one case worthy of unusual interest.

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MOVABLE KIDNEY—INDICATIONS FOR, AND METHODS OF FIXATION

By JNO. A. GAINES, M.D., Nashville, Tenn.

By movable kidney is meant a kidney which wanders to an abnormal degree from its anchorage in the loin; with the blood vessels and nerves, and at times the ureter as a fixed point, and which remains post peritoneal. This is not to be confused with floating kidney which is of congenital origin, and is surrounded by peritoneum possessing a more or less complete meso-nephron.

There are several theories as to the cause of this abnormal mobility, some of which confine the cause to a single element, as for instance, to an abnormally shallow depression in the loin with a smooth outlet allowing the kidney to glide out of position. Another believes it due to decrease in intra-abdominal pressure. Watson believes it due to abnormal weakness or absence of the fibrous or connective tissue attachments to surrounding parts.

The truth perhaps rests in less radical views, and embraces more than one element. I believe with Watson that the most important factor as shown by his experiments is the connective tissue attachments in holding the kidney in place, and that ultimately these must give way before a kidney can wander from its normal location. The loss of perirenal fat, the relaxed abdominal wall as after pregnancy or delivery at term—falls and blows—and finally a relaxed condition of the supports of the abdominal organs leading to degrees of ptosis, short of Glenards disease, which in itself is a congenital lack of normal supports, embracing those of the kidney, and is not considered in this paper, and is in no sense related to the surgery of the kidney as a cure for the disease with which this type of movable kidney as a cure for the disease with which this type of movable kidney is associated. All of which are factors predisposing to the giving way of the fibrous anchorage of the kidney.

The symptoms of movable kidney depend on those essentially due to accidents. In proof of this it will only be necessary to call attention to a fact agreed to by most observers; namely, that a vast majority of patients possessing such a kidney have absolutely no symptom referable to the conditions.

Among the accidents of the condition are the drawing on the pedicil, consisting of blood vessels and nerves, producing actual pain or a sense of drawing or heaviness, in the loin. At times the attachment to the overlying peritoneum is not loosened and by dragging on this produces distortion of the duodenum or bile ducts with partial abstruction of these structures with attendant symptoms.

By the descent of the kidney the ureter may be bent short or kinked, producing hydronephroses of any degree, at times leading to dietlescrisis, in which the pain is excruciating, and is characterized by the sudden cessation of pain, to be followed at once by the passage of quantities of urine. Mucous colitis is often associated with these cases, demanding surgery.

The diagnosis, after all, will depend on the palpatating of the kidney, finding it movable over a wider range than one and one-half inches, which is within normal limits. The kidney is recognized by its characteristic shape, by the fact that it can be brought down by deep inspiration, and held in this position on expiration, and that when released or pressed up it will disappear in the loin in its

deep location. Pressure on the kidneys causes a complaint of pain of a sickening type, not unlike pressure on the ovary or testicle.

The disturbance both through direct traction on the nerves, disturbing the normal balance of the abdominal sympatheties, and secretory inervation, and by the mechanical interference with digestive function, at times produces a chain of symptoms embraced in the general description of neurosthenia, and is at times, associated with the condition of so-called, mucous colitis.

Movable kidney must be differentiated from distended gall bladder, if on right side; and from fecal or tumor masses in side or in the wall of the intestine, or tumors of the mesentry or omentum; or if on left side from a loosely attached or enlarged spleen, or from a tumor springing from the head of the pancreas on right side, and the general symptoms must be carefully differentiated from gastroentroptosis described by Glenard.

It may be distinguished from distended gall bladder by the fact that the gall bladder lies near the abdominal wall instead of deep in the loin. It descends as does the kidney on deep inspiration but cannot be caught and held during expiration, but rises and falls with the liver, with which it is continuous. The gall bladder is globular and never kidney-shaped. It is usually more acutely tender than the kidney and often a sense of fluxuation may be elicited, and movement of the gall bladder independent of the liver is lateral while that of the kidney is perpendicular.

From tumor of the intestine or fecal mass it should readily be distinguished (aside from the urinary symptoms of the kidney condition), these conditions are often assodiated with some degree of obstitation. The mass is less movable in the long axis of the body and it is quite impossible to press it up into the normal position of the kidney, and when released from any degree of motion will at once assume the original position. And is not of kidney shape.

On the left side the spleen if enlarged, can be distinguished by the notch in the margin—by the fact of its being superficial, and when enlarged it comes forward to first produce dull percussion note over Traub's semilunar space, which the kidney never does.

Tumors of pancreas beside being often associated with chronic gall stone disease is quite immovable, and while they, like the kidney, may give tympanitic percussion note due to overlying intestine yet the irregular shape and fixed position when taken together with absence of urinary or genital symptoms should make this clear. The dull percussion note over spleen and gall bladder are quite characteristic on the respective sides and should be borne in mind.

The most difficult question in the consideration of this subject is the relation of movable kidney to neurasthenia and this should receive the most careful consideration.

That movable kidney can superinduce this state, I am quite positive, as I have given quick and permanent relief by the simple measure of fixation alone. On the contrary, where movable kidney is only coincident and not causative, there is no indication for operation other than to meet some accident of the kidney condition without hope of relieving the neurosthenic state.

I believe mucous colitis when due to the wandering kidney is caused by the nervous influence produced by disturbing the abdominal sympathetics, from traction on the nerves in its own pedicle, or by traction through the peritoneal attachments producing distortion of pyloris, or by mechanical obstruction from pressure; in which instance the digestion is interfered with both by altered secretions and by mechanical hindrance.

As suggested, movable kidney by traction may distort the bile ducts and cause acute or chronic disease of the gall bladder, or in some cases by pressure disturb the circulation of the appendix so that a chronic congestion makes this organ susceptible to inflammation.

Without discussing the numerous methods of fixation as devised and practiced in the evolution of this technique, from the barbarous method of treating the wound open, down to the present time when the Ediboles

or some modification of his operation is practically universally used. These variations when used consist mainly in the placing of the sutures. After incising the tissues down to the fatty capsule this should be torn through by blunt dissection and freely loosened from the kidney, which can then usually be delivered through the wound on the surface and there have the fibrous capsule incised, reflected and the stitches placed through capsule and left long for final placing later. If from any cause the kidney cannot be delivered through the wound without great violence to its structure, it should be held in place by pressure on the abdominal wall by an assistant, and the reflection of the true capsule and the stitches placed in situ. The suture material should be absorbable. I prefer twenty-day No. 1 chromic catgut. This should be placed so that the upper sutures should be about the center of the kidney, as placing them all at the lower pole of the kidney, might allow a tilting of the upper pole of kidney causing kink in ureter or interference with circulation of the organ. An attempt to place the kidney in its normal original place should not be made —but perfect results are obtained by bringing well up to twelfth rib.

The sutures should be placed so that they will hold the fatty capsule out of the way, and at the same time bring the denuded kidney surface against the incised muscle surface, and so that no constriction is produced when tired. Personally, I do not believe it necessary, or advisable to penetrate deeply into the kidney surface with the sutures, and confine my stitches to the lower layers of the capsule after turning the cut margin back on itself. I usually use five sutures in the capsule proper, and one at the lower angle of the wound started in on one side of lumber facia, taking up the reflected fatty capsule at several points, and out on the opposite side of wound through lumber facia—thus puckering up into a considerable mass the fatty capsule at lower pole of the kidney, which acts as a brace to the kidney when the remainder of the sutures are tied, which are done from below upward—the ends of the sutures being threaded in pairs through large-eyed non-cutting nedles, and so placed as to leave the kidney in contact with raw muscle.

The wound is then closed with chromic gut, ten-day No. 1, without drainage, care being taken to control all hemorrhage before sutures are tied.

This method gives the minimum of discomfort to the patient with the maximum of surgical success.

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THE IMPRESS OF ENGLISH THOUGHT ON MEDICINE*

By FRANK A. JONES,

Professor of Physical Diagnosis and Clinical Medicine, Memphis Hospital Medical College, Memphis, Tenn.

The motives which have prompted the writer to prepare this paper are many-fold. First, to stimulate the young men of our association in acquiring a more thorough knowledge of English literature in its relation to medicine. Second, to exalt and magnify our own achievements and triumphs and to admonish certain medical centers in Continental Europe that they must begin to learn the Golden Rule, and that they must "render unto Caesar the things that are Caesar's" pertaining to things medical. Third, to review medical history, and show what the English-speaking people have done, what they are doing, and what they are destined to do. Several months since I read in one of our most influential medical journals, which has the largest circulation in this country, an article by a prominent professor in one of our great medical colleges, deploring the fact that America had no great internests; that we were not scientific; that our method and technique are faulty. At the June meeting of the American Medical Association, held in Atlantic City, I heard a German professor in one of the New York medical schools, make the remark that there was not a single paper read in the section on medicine that could be regarded as scientific. It is high time that conditions prevailing to such a degree as to provoke such expressions should be corrected. Nay, not corrected, but refuted. As a matter of fact, the epoch-making, monumental work which has been done, both in medicine and surgery, has been accomplished by English-thinking people. Great Britain has been the alma mater. At present Great Britain is still as much on the throne as any other nation, and the United States is heir apparent to the throne. For the benefit of our young men just entering their careers and in joining the association, let us briefly recall a few facts pertaining to English achievements in medicine.

The pioneers on diseases of the heart and blood vessels were English and their present-day books on the same subject are vitalized and energized with up-to-date thought. Can Continental Europe, particularly Germany, boast of a greater array of men than Sir Richard Corrigan, Stokes, Adams, Walsh, Graves, Sutton and Gull, Gibson, Sipson, Broadbent, Peacock, McKenzie, West and Gee? We all might read with profit Stokes' book on "Diseases of the Heart," published in 1855. Sutton and Gull, Englishmen, gave us the first description of arteriesclerosis. Graves and Parry's work on exopthalmic goitre, both Engilshmen, still stands as a monument to them. The German, however, in describing this condition, call it Basedows disease, because Basedow happened to be a German and wrote on the subject several years after Graves. Medical history has given Graves the credit of having first written on the subject. Myoxdema was first described by Sir William Gull, an Englishman. Hughes Bennett's name will forever be linked with that of leukemia, although the German authors seldom mention his name in connection with the subject. Virichow is exalted and magnified as being the original

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researcher on leukemia. Look over medical history, if you please, and see if Bennett was not the first to describe leukemia in detail. Pernicious anaemia suggests the name of Addison, an Englishman, as the first writer upon this subject. Pseudo-leukemia, or Hodgekins' disease, is the work of an Englishman, Hodgekins himself. Sydenham and Gerard first stamped their names on gout as we now see it. Read, if you please, Sydenham's original description as it occurred, he being the patient.

The names of Thomas Willis, Matthew Dobson and John Rollo, all Englishmen, stand out pre-eminently as the first writers of modern time on diabetes. Bright, an Englishman, possibly first taught the world something about nephritis. Since the day that Harvey, an Englishman, discovered the circulation of the blood, Anglo Saxon thought has never been stagnanted.

There is no passive hyperemia nor engorgement, nor edema, nor stasis, nor anasarca, nor ascites. There may have been a slight accumulation of wind in some quarters as the results of a premature unright scientific fermentation. Of late I have been reviewing the various text books on diseases of the heart; among them Nothnnagel system on the heart, edited by our own Dr. George Dock, of New Orleans. In reading the chapter on aortic regurgitation by a German professor in the great German university, Sir Richard Corrigan's pulse was described at length, but Corrigan's name was omitted. The Austin Flint murmur which frequently occurs in aortic regurgitation was also described. Its mechanism, etc., but Flint's name was omitted—the only reference made to Corrigan and Flint was in footnotes by the editor.

Passing from past achievements and triumphs of English thought in medicine, directed and guided by Great Britain, let us come briefly to the present status of medicine in this country, and in our mother country, England. Of course, we readily recognize the fact that medical thought in the British empire has been growing and maturing and fructifying for several centuries. Taking a general survey of the field of medicine as we see it at present, we find her men are abreast with the times. They are conservative, they are practical, they are scientific. Their scientific investigations are in direct relation to their practical application. It is a source of great satisfaction that none of the many reactions which "have at various times and in sundry places" been hurled upon us have not come from the pen of an Anglo-Saxon.

Some of these reactions are so inactive, so inert, so dead, so uncertain in their action, that they have not enough action to bring about a reaction in English medical thought.

Medicine in this country is not as yet made; it is in the making state; it is in the creative stage; it is in the "melting pot," so to speak. With English and French culture and German science back of us as a fulcrum, together with our own Democratic spirit and our own individuality in work, we are rapidly coming to the front and are taking our places where we rightfully belong. We have had great clinicians and great surgeons; we still have great internests, and greater surgeons; we have great pathologists, great chemists, great bacteriologists. Time is too limited to mention the numerous internests and surgeons we have, and what they are doing. What we are accomplishing in the scientific and experimental field of medicine I need only to reefr you to "The Archives of Internal Medicine," published by the American Medical Association and edited by Joseph M. Miller, of Chicago; Richard C. Abbott, of Boston; David L. Edsall, of Philadelphia; Theodore Janeway, of New York; W. S. Thayer, of Baltimore, and our own George Dock, of New Orleans. I would also refer you to the Journal of Experimental Medicine and the American Journal of the Medical Sciences.

In Austin Flint, at the time he lived and wrote the true clinician reached his highest pinnacle. While he was a teacher in this

city, he collected clinical data out of which he wrote his great book, "Diseases of the Respiratory Organs." He wrote the book, however, after having moved to New York, but gives credit in his preface to the work he did while in New Orleans. Contrast that book today with works on the same subject. Take any book you may on physical diagnosis or practice of medicine, and read what they have to say on pyo-pneumo-thorax. Then read Flint on the same subject and draw your own conclusions. His description is as far ahead of present day description as sunlight is ahead of moonlight. Flint molded thought in this country. His life and works were inspiration to his students. Samuel D. Gross, the great surgeon, in depth of thought and in his voluminous writings has had no superior in this or any other country. It is a happy thought that both of these great giants, these great leaders, acquired considerable of their knowledge teaching in the South before their removal to the East.

If I have read medical biography correctly, neither of these men ever went abroad; their knowledge each in his respective field was not imported. It was democratic, rather than aristocratic or autocratic. It might be asked by some, would their influence not have been greater had they sat at the feet of the so-called great masters in Continental Europe? The answer is no. They were too broad, too deep, too great to have any masters. Had they been of a patronizing temperament and gone to the fountains of knowledge abroad, they might have lost some of their personality and returned with this inscription which we frequently see in the commercial world: "Imported; these goods made in Europe."

Heaven be thanked America was great enough for Flint and Gross, and the Southland was their home, where they wrought and taught for many years; Flint in New Orleans and Louisville; Gross in Louisville. What an inspiration to us of the present generation to reflect upon the lives of these men. Opportunities are all around us. We are living in an era of prosperity. Our schools and universities are being endowed and enriched. Private donations are being made almost daily for laboratories for research work. No nation is destined to do greater things than we in the next decade. We have taught the world already a lesson in sanitation and hygiene in the building of the Panama Canal, under the direction of General Gorgas. We are well in the lead on tropical and sub-tropical medicine, and with the development and completion of the Panama Canal and with our possessions in the Philippines and with our commercial contact with the Orient, we propose to be masters in tropical, sub-tropical and infectious diseases of all kinds. May I venture the prophecy that New Orleans will become the greatest port of the Western Hemisphere; that a school of tropical medicine will be established here; that Tulane University will take a hand in things medical and make her influence reverberate around the globe? It is a happy thought that Johns Hopkins and Tulane are Southern universities. The time is ripe for us to make great interests. We have made the greatst surgeons the world ever knew. We expect to make great pathologists. Let us make them at home, tailor made to order, and not have any manufactured hand-me-down goods from Continental Europe.

We are free to confess that the Germans are living repositories of dead room pathological medical knowledge; that they are eminently scientific in all things; that they are leaders in scientific thought; that they have great internests, great pathologists, great biologists, great chemists, and great bacteriologists. We honor her for her fidelity and loyalty to science. Such men as Virchow, Koch, Laube, and Khrel and Grawitz have made her great. But let Germany remember the fact that the classics combined with the sciences will make her still greater; will cause her to give honor where honor is due, and credit to whom credit is due. Science runnig too far ahead of the classics, has a tendency to put medicine in a state of unstable equilibrium. Let science and the classics measure even in the scales.

Let the teachers high up in the ranks in our great medical schools of America teach more, and preach more in the English language and about English medicine and about English thought. We have no objection to their thoughts being embellished and frescoed and veneered by foreign ideas if they think they can accomplish more thereby, but let them sing on the key in English; give English thought the prominent place on the stage—the leading role. When they write long papers with the bibliography longer than the paper, let them be careful first to look up the English literature upon the subject.

We are reaching the age of maturity. We are able to stand alone. We are taking off our knee pants and donning long trousers. We are capable of doing and thinking some for ourselves. We return grateful thanks to our fathers and mothers of Continental Europe for leading us gently on. We, the sons and daughters, however, must admonish them that we are doing things also and expect to do more.

In conclusion, gentlemen, may I ask what do the Southern Medical Association and our Southland propose to do in the way of stamping the image of English thought on medicine? The South is of America the most American. We glory in her traditions of the past. We have visions and dreams of her future greatness. We are making rapid strides in commerce, in agriculture, in manufacturing, in intellectual pursuits. Tom Carlisle has said "Commerce is king." Let us crown Culture as queen. Prior to the Civil War we had a broad, wholesome culture. We had our great statesmen, our great generals and our great orators. It has been a habit in times past of New England accusing us of the South of not having produced much literature and but few poets. Mark my statement; the time is close at hand when the writings of all our poets will be collected and will be put in book form and will be read from the Atlantic to the Pacific and from the Gulf to the Lakes. No poets! What about Sydney Lanier, of Georgia; Paul Hamilton Haynes, Henry Timrod, William Gilmore Sims, of South Carolina; Irwin Russell, of Mississippi; Peck, of Alabama; Father Ryan, of Alabama; Walter Malone, of Tennessee; Theodore O'-Hara and Madison Cohn, of Kentucky, and last, a man whose genius has no bounds, whose poetic soul has touched the hearts of the universe, whose name to-day lives in spite of literary hyenas, uppermost in all cultured centers, that wizard of pathos and rhythm whom the critics of France and Germany hav pronounced the greatest poet America every produced, Edgar Allan Poe, of Virginia? At present we are producing good fiction and good novels. Joel Chandler Harris, Thomas Nelson Page, George W. Cable, of this city; James Lane Allen, of Kentucky; Charles Egbert Craddock, Henry Stilwell Edwards, Miss Johnson, Augusta Evans, Harris Dickson, and Thomas Dixon are household names in the field of letters. Pratcically all of the great universities of the East and West in their various departments have Southern born and Southern educated men in their faculties. Woodrow Wilson, of Princeton, Butler, of Columbia, Dabney of University of Cincinnati, as instances. I have touched upon the above facts to show what we can do in medicine. Prior to the Civil War, Louisville, New Orleans, Nashville and Charleston had medical faculties second to none in this country. One of the chief functions of the Southern Medical Association should be to make history in high medical standards. To conserve and build up our Southern medical colleges, to exalt Southern medicine where it rightfully belongs, to keep our own medical talent in the South, instead of having it transplanted to the East and to the West; to welcome men of talent in our Southland, it matters not from what section they may have come; to stimulate our men in keeping records of important cases and reporting them in our various high-class medical journals.

I read an interesting article not long since

by a New England man, a Bostonian, in which he said the difference between the New England men and Southern men is this: the Southern man reads and observes; but does not take notes. The New England man reads and observes and takes notes, and has them recorded in books. In a measure this statement is correct, and I am afraid it holds too true in medicine. It is a lamentable fact that we have but few text books on medicine by Southern authors. The South is growing rich at a marvelous rate. Our instittuions are being endowed and enriched. We can congratulate ourselves upon the fact that one of the greatest universities of the world endowed by Southern men located upon Southern soil in a Southern city heart and soul—Johns Hopkins. It regulates the standard of medicine. In its influence it is a national and international. We felicitate ourselves that Tulane is growing greater every day, that her endowment is bountiful and varied in its distribution. The spirit of consolidation is upon us. In Louisville the five medical schools have been merged into one, and has become the medical department of the University of Kentucky. This will make Louisville even a greater medical center than she has been in the past. In Nashville the University of Nashville and the University of Tennessee have been merged into the medical department of the University of Tennessee. If our genial chairman, Dr. Witherspoon, with his good sense, with his pleasant personality and with his charming oratory would only exercise some of these faculties with the Vanderbilt family and secure an endowment for the medical department, Vanderbilt will become still greater in her influence. We have th country, we have the schools, we have the men, we are getting the money. Let us record our data, let us write books and magazines; let us merit recognition and then demand it. Let us take a hand in the doings of the A. M. A. Let the star spangled banner of progressive medicine wave over the home of the free and the land of the brave. Let our motto be "English medicine for English-thinking people."

PRETABETIC LARYNGEAL SPASM

By DR. H. H. MARTIN, Savannah, Ga.

Recurring laryngeal spasm in an adult without definite cause can safely be attributed to one of two conditions, viz: Beginning tabes, or pressure on the pneumo gastric nerve from aneurism or other mediastinal tumor.

The case reported in this paper is a typical recurrent laryngismus, and is especially interesting because I was able to demonstrate two of its most prominent features which I have not seen mentioned in the reports of similar cases, namely, that the spasm was not limited to the larynx, but extended into and involved the bronchi, and that the spasm interfered with the function of expiration to a much greater extent than that of inspiration. In fact, it seemed that, until the air cells were so distended that they could contain no more air, the latter function, while stridulous in character was but little impeded.

Freiberg and Freer, of Chicago, and T. W. Moore, of Huntington, W. Va., each report a case similar to mine, but do not mention the two especial observations made in my case. Namely, the involvement of the bronchi, and the marked difference between the relative interference with inspiration and expiration. In all other respects their observations were identical with mine.

Freiberg and Freer made only a preliminary report of their case, and did not state the outcome, while in Moore's case and my own, tracheotomy was performed and a tube left in, but without avail, both patients succumbing to bronchial spasm within a fortnight.

In 1907, Dr. Harland of Philadelphia, presented a paper on "The Larynx in Locomotor Ataxia," in which he reported a number of examinations of larynges of patients with tabes; prefacing his report with the statement that "Practically nothing of great interest was discovered, but that it seemed worth while, because in the text books and elsewhere, one is led to believe that laryngeal trouble is rather frequently found in locomotor ataxia," and concluding with the statement that he had been unable to find a tabetic case with laryngeal crisis, and that neurologists of his acquaintance say that they have rarely seen cases of this kind, and to show the trend of opinions quoted from numerous books and periodicals as follows:

Touche: Twelve out of forty cases of tabes had laryngeal crises.

Greene: Seven out of sixty cases of tabes had laryngeal crises.

Coakley writes that "In the first stage of tabes there is occasionally seen a spasm of the laryngeal muscles, resembling laryngismus stridulous, and that such a symptom in the absence of foreign bodies should lead one to seek for other symptoms of tabes."

Grundwald asserts that "Tonic spasm of the abductors is frequently seen in tabes, giving rise to the well known laryngeal crises, characterized by sudden attacks of dyspnoea with loud inspiration, the cords often remaining fixed in adduction for a considerable length of time."

Osler writes that in his experience, "The gastric and laryngeal crises are the most common forms of crises in tabes, but that even so, laryngeal crises are rare, but that in one instance at least the patient died during the attack." In the face of all these quotations, Harland concludes as follows: "The larynx is seldom seriously affected in locomotor ataxia."

Rarely, early in the disease spasmodic abductor, paralysis may sometimes occur, etc.

In 1908, Dr. W. Freudenthal, of New York, takes issue with Dr. Harland in what he calls his "Astonishing findings" (and they are astonishing to any one who has read and observed locomotor ataxia) as follows: "The statements of Dr. Harland that 'the larynx is seldom seriously affected in locomotor ataxia,' and that he was unable to find a tabetic case with laryngeal crises were so much at variance with my own experience and all that I could read on the subject, that I naturally devoted especial attention to these points."

Dr. Freudenthal reports thirty-four cases in which he examined the larynx, five of whom had laryngeal crises. Out of the first twenty, there were but six with normal larynges, while

"THE MUSCLES RELAXED, WHEN THE CORDS WOULD FALL APART."

three had laryngeal crises. Out of the remaining fourteen there were eight normal larynges and two with laryngeal crises.

Among Freudenthal's conclusions, occur the following: "The larynx is frequently the seat of serious affections in tabetics."

"Laryngeal crises are met with so often that they are almost of pathognomonic significance." In the discussions of these two papers a number of cases of laryngismus were reported, but briefly and without essential detail.

The case which I have to report came under my observation at about three A.M., August 25, 1908.

He had just had his first attack. History as follows: Age, forty-two, positive history of syphilis, had enjoyed good health lately, drank to excess in early manhood, and had been treated for throat trouble (indefinite) for about six weeks with sprays and gargles.

Present attack came on after retiring, lost consciousness, but finally recovered. Family state that he was unconscious for ten minutes. On examination, fauces, pharynx, etc., normal; larynx normal in color, but cords were in the position shown in the illustration, and remained so until the end, excepting during the attacks, when they were closely approximated with no visible chink during expiration, but some passage of air during inspiration.

I had occasion to examine the larynx a number of times during these crises, and it was always the same, dyspnoea increasing until the patient lost consciousness and the muscles relaxed, when the cords would fall apart as shown in the illustration, the air would rush out, respiration would become slowly reestablished, the patient would regain consciousness, and insist upon going about his business.

The attacks continued to increase in frequency and in severity until after falling on the street he consented to enter a hospital where he remained to the end.

Dr. Jones, of Savannah, my consultant, made repeated and careful examinations for thoracic or mediastinal tumor without result, and we were forced to the conclusion that the cause was, beginning tabes, although no other symptoms of tabes could be demonstrated. He was at once put on vigorous anti-syphilitic treatment, but with no appreciable result. The frequency and severity of the attacks continued to increase and, after several of them being restored to consciousness only with the greatest difficulty, tracheotomy was determined upon as the only hope for prolonging his life. An attack came on while patient was being carried to the operating room and was repeated, immediately upon the beginning of the administration of the chloroform, this attack was prolonged until all signs of life had disappeared, when the knife was plunged in without dissection, just below the cricoid and three rings of the trachea divided. Then by

holding the trachea wide open all air was expelled from the lungs and respiration reestablished by means of artificial respiration. But just as soon as we had succeeded in restoring life and consciousness, the spasms would recur, below our trachael wound and the patient would again lapse into unconsciousness; but with the trachae open, life and consciousness would return and respiration would be reestablished spontaneously. This continued for upwards of two hours, when the spasms ceased and the patient was returned to his room. He lived for ten days, with frequent recurrences of the spasms, but would recover spontaneously each time, growing weaker and finally succumbing to a combination of exhaustion and asphyxiation.

An autopsy was not permitted, and we were left in the dark both as to the cause of his trouble and the immediate cause of death

THE IMPORTANCE OF THOROUGH DENTISTRY AND OF DISINFECTION OF THE MOUTH FROM THE VIEWPOINT OF THE ABDOMINAL SURGEON*

By STEPHEN E. TRACY, M.D., Gynecologist to the Stetson Hospital, Philadelphia.

The surgeon who considers the welfare of his patients must examine most thoroughly every part of the body before undertaking any operation. In following out my work along these lines I am impressed more and more each day with the lack of regard the average patient has for the condition of the teeth and the cleanliness of the mouth That such a condition exists is due to lack of education in this direction, and the people largely responsible for this state of affairs are the dentists and the clinicians.

The dentist is looked upon by the public in general as a man who fills teeth, extracts teeth or makes artificial teeth. In other words, he is looked upon as a mechanic who has no part in the practice of medicine. And I regret to state, judging by the superficial careless manner in which many dentists do their work, it is evident that they consider themselves in the same light. When the dentist realizes that he is a specialist in one of the most important branches in the practice of medicine, combines this principle with his mechanical ingenuity, fills all cavities, replaces every missing tooth, scales and polishes every part of the natural teeth, regulates every tooth until the occlusion is perfect, impresses upon his patients the importance of thorough dentistry and of oral prophylaxis, then will he be practicing his profession as he should and will be regarded by the community at his true value.

The person who is really responsible for the terrible condition in which we find the mouths of many patients is the clinician. It pains me to state that the average physician pays practically no attention to the condition of the mouth. Writers upon medical subjects, both physicians and surgeons, seldom mention the mouth as an etiological factor in the production of disease. In works upon the practice of medicine mention is made of the importance of a good set of teeth in considering disturbances of digestion. Such disturbances are usually attributed to indiscretions of diet and nothing is said about the mouth with its twenty or thirty inches of surface covered with all kinds of infection, or of the importance of cleansing this germ-covered area. That infections of the mouth may play an important part in the production of disease in the gastro-intestinal tract or in other parts of the body, has largely escaped the attention of the medical profession. Dr. D. D. Smith read a paper before the Philadelphia County Medical Society, some three years ago, in which he called attention most forcibly to infections of the mouth as a cause of disease in the gastro-intestinal tract. Smith stated that he had seen disturbances of digestion, nervousness, irritation of the kidneys, and many other abnormal conditions cured by no treatment other than disinfection of the mouth. Dr. Register states that he has seen many cases of gastric catarrh associated with pyorrhoea alveolaris cured by thorough surgical treatment of the mouth. Sir Edward Treves states: "If people were a little more careful about their teeth they would not need to be so careful about their diet." Who could wish for a more rational explanation for a gastric or gastro-intestinal disturbance than a constant infection from a purulent mouth? The more attention I give my patients as regards the condition of

From the Dental Brief, February, 1909.

the mouth the more I am in accord with the position taken by Smith, Register and other writers upon this subject.

Every day patients are sent up to the hospital for operation, and upon examination of the mouth it is found that one or many teeth are missing, the alignment irregular, and the points of contact imperfect. The teeth that remain are frequently covered with a deposit of tartar and putrescent matter. Sometimes there is an abscess of a tooth with pus discharging into the mouth, and in many cases there are symptoms of a marked pyorrhoea alveolaris and the mouth is alive with infection. Dr. Paul G. White, of Boston states: "The great sanitary reform of the world is not the abolition of the village closet, but it lies in the herculean task of revolutionizing the unsanitary and infectious condition of the human mouth."

When I see patients whose mouths are in such a terrible condition I always wish I could refer them to a competent dentist to have the teeth scaled and the mouth disinfected. The risk of operating upon such a patient is greater than if the mouth were in a healthy condition.

A patient whose mouth is in the condition as already described will absorb a certain amount of toxines which will lessen the resistance of the tissues, change the chemical composition of the blood, have a vicious influence on all the organs, and will predispose the subject to many diseases. If a patient in such a condition be given an anaesthetic, after the operation the emunctories will be called upon to eliminate not only the anaesthetic but also the toxines which have accumulated within the body. At this time the kidneys are the chief organs of elimination. If the amount of toxines passing through the kidneys be sufficient to cause an acute nephritis with diminished functional activity the patient may succumb from renal insufficiency.

When the mouth is alive with germs the infection will certainly be carried into the gastro-intestinal tract, where it will cause irritation, fermentation with the production of gas, distention of the bowel, or may even cause disease of a specific character. If no attempt be made to diminish the amount of infection carried from the mouth to the gastro-intestinal tract after operation, the fermentation continues, the bowels become distended with gas, the patient is uncomfortable and the surgeon has just cause to worry, as he does not know at the beginning whether or not his patient is developing a peritonitis.

Careful attention to the teeth and disinfection of the mouth should begin with the infant whose gastro-intestinal tract is most susceptible to bacterial infection. White states: "It is a well-known fact that dental treatment early in life prevents more disease in after life than any other measure taken by governments, not even excepting vaccination." During the last year I have operated upon several children from two and a half to six or seven years of age for appendicitis, and upon examination it was found in nearly every instance that the teeth were decayed and in no case had any attention been given to cleansing the teeth or to disinfecting the mouth. I shall not go so far as to claim that the acute condition in these cases was due to the infection of the gastro-intestinal tract from the mouth, but I do believe it was a factor. Infection of the mouth, carried continuously into the sensitive stomach of the child, will, the same as bacterial infection from milk or any source, cause a catarrhal condition which in time will extend the whole length of the gastro-intestinal tract and include the vermiform appendix in its course. In a recent article on the prophylaxis of appendicitis, Witthauer states that bacterial influences must be combatted by care of the teeth and mouth.

In the more recent text books on appendicitis, indiscretions of diet and gastro-intestinal catarrh are given a prominent place in considering the etiology of this disease. Mention is made and cases are reported in which a patient suffering from tonsilitis a few days later developed an acute appendicitis and the organisms recovered from the appendix were the same as found in the tonsils. Even with

this evidence, that appendicitis may result from infection of the tonsils, no mention is made of the importance of oral prophylaxis.

A complication which arises occasionally after operation, and may be due to infection from the mouth, is parotitis. This is a complication which causes high fever, marked prostration and much pain for the patient, and may even cause a temporary paralysis from pressure on the terminal filaments of the facial nerve. In some cases the condition may go on to suppuration, which may require an incision with the resulting scar.

In considering the subject of infection of the mouth we cannot and must not overlook the respiratory tract. When a patient inhales an anaesthetic through a badly-infected mouth and pharynx the infection may be carried into the respiratory tract and the lungs after being irritated by the anaesthetic have not the normal resistance. I have no doubt that many cases of post-operative pneumonia are due to inspiration of septic material from the mouth. It is scarcely necessary for me to tell you that a pneumonia in a patient recovering from the shock of an operation is one of the most serious complications with which the surgeon has to contend. Dr. Register, in a paper read before the New Jersey State Dental Society, called attention to septic pneumonia following the extraction of abscessed teeth.

In preparing a patient for operation it is most important to empty and tone up the gastro-intestinal tract, and this is the extent of preparation most surgeons give to the alimentary canal. For some time it has been my custom to examine the mouths of all patients who present themselves for operation. In case the teeth are covered with a deposit of tartar and putrescent matter, in case there is an abscess of a tooth, or a well-marked pyorrhoea alveolaris, I have the mouths of all such patients swabbed, or, what is better, scrubed with a tooth brush with pure hydrogen dioxid three or four times a day. Every patient is given a glass of an alkaline antiseptic solution with instruction to wash the mouth many times a day. In case the infection is severe, if possible, the operation is deferred until the condition of the mouth is improvd. In cases of marked infection of the mouth I always fear a post-operative pneumonia, a pleurisy or an oedema of the lungs. After operation, when the patient is recovering from the anaesthetic, and is suffering from thirst before the stomach is retentive, much relief can be given by washing the mouth with a piece of gauze saturated with the cold alkaline antiseptic solution, and the keeping it clean and sweet throughout the convalescence by the frequnt use of such a solution. Since this line of treatment has been instituted it has been found that the patients are more comfortable, do not complain of a stickiness or of a disagreeable taste in the mouth, the appetite returns more promptly and as a result the patient takes more nourishment, convalescence is hastened, and I have less anxiety about complications which may arise as a result of infection from the mouth.

May we not hope for the time when the dentist will have the physician educated to realize the benefits to be derived from thorough dentistry and from disinfection of the mouth. When that time arrives the physician will examine the mouth of every patient, and when necessary refer the patient to his colleague, the dentist, to correct defects and disinfect the mouth in order to eliminate the oral cavity as an etiological factor in the production of disease. Then, when the patient is referred to the surgeon, he will operate with more assurance and will not worry about complications which may arise as a result of infection from the mouth, and the patients will have a more rapid and agreeable convalescence.

THE PROPHYLAXIS OF PELLAGRA*

By C. H. LAVINDER, Passed Assistant Surgeon, United States Public Health and Marine-Hospital Service.

The prophylaxis of any disease must necessarily depend upon its cause, and with equal necessity the efficiency of prophylactic measures must be in ratio to the definiteness of our knowledge regarding such cause.

First, then, what do we know of the cause of pellagra? Do we possess any knowledge of its cause so definite and accurate that it may be applied efficiently in the institution of general prophylactic measures?

Broadly speaking, we may divide the theories as to the etiology of pellagra into two large groups, viz.: those of the Zeists, who think there is some definite etiologic relation between Indian corn and pellagra, and those of the Anti-Zeists, who oppose this view.

In the latter group there is really but one body of students, and that is composed largely of the French school, who deny that pellagra is a morbid entity and regard it only as a symptom complex occurring in alcoholics, insane persons, and in persons in other depressed states. This idea, for our present purposes, may be disregarded.

The Zeists include nearly all students of the disease, but their views are by no means harmonious. Putting it in a general way, their various ideas as to the etiology may be placed in three general divisions: (1) That it is an intoxication (toxico-chemical); (2) that it is an autointoxication (toxico-infective); (3) that it is a specific infection either by bacteria moulds or protozoa. All these variations, however, it must be noted, take into more or less essential consideration the relation of the disease to corn; the intoxication, the autointoxication, or the infection being in some more or less definite way regarded as usually connected with or derived from that grain.

It must be added, however, that while in most of these theories corn is regarded as an essential factor in the etiology of the disease, in others this cereal is not regarded as an absolute necessity, although much importance may be attributed to it. (Ceni.)

Taking this general view of the etiology of the malady, what shall be said concerning the communicability of pellagra? This is a very natural and a very important question, and to some minds in this country has become indeed a very acute inquiry. In attempting to answer this question to our satisfaction we should not forget, as we are very likely to do, that while pellagra is a new disease to us, it is an old problem to many other countries and has attracted the attention and occupied the minds of many able men. This question has, of course, arisen among them, too. What is their answer? It has been given many times in the negative. And, what is more, their conviction has been carried into practice for, so far as I am aware, quarantine, and measures of isolation have not been put into practice in the prophylaxis of pellagro in those countries which have suffered most from its ravages.

Holland,[1] after a trip through Italy observing pellagra, states that the question of the communicality of the disease can be answered decidedly in the negative.

Roussel,[2] the great French student of pellagra, says, speaking of contagion in this disease:

> Although the hypothesis of a pellagrous virus has had a place in the discussions of the last

*From U. S. Public Health Reports.

[1] Medico-Chirurgical Transactions, London, 1820.

[2] Traite de la pellagre, Paris, 1866.

century, and has even appeared in divers authors of our own time, it has seemed to me useless to try to refute it. It can be said of the contagion of pellagra that it is a question fully determined . . . pellagra is not contagious.

Procopiu[3] says:

The disease is not contagious and the sick may associate intimately and freely with the well; and if spoiled maize is not eaten, the disease does not occur.

Cutting (unpublished consular report), while not a medical man, made an extensive report on pellagra, after personal observation and study in Italy, and his opinion may be taken to represent, to some extent at least, the Italian belief on this point. He says:

Pellagra is neither infectious nor contagious. It is transmissible, like insanity, in the form of a previous disposition.

Arnould,[4] in discussing contagion and infection in pellagra, says that there are a great many facts connected with the disease which might incline one to consider it to be infectious, but not necessarily transmissible from man to man. He further says that spoiled maize seems to to him to play a role so real and so large that any other supposition at present would involve questions and open up perspectives at which he hesitates. He also adds, in speaking of hereditary transmission, that this is the only means of conveyance from man to man, and that besides this, up to the present, the pellagra "germ" is only a metaphor.

Statements on this point are wanting in many writers. The reason is evident. The general conception of the nature of the disease at once forbids any idea of its communicability. Obviously it would be foolish for those who entertain the intoxication or autointoxication idea of the disease to consider its communicability, and as for those who regard it as a specific infection, an analysis of their complete views would likewise render quarantine or isolation unnecessary. The one possible exception would be the suggestion that the disease may be due to an insect-borne, protozoal parasite, and in this case the absence of any definite knowledge as to the nature of the insect would in all likelihood render quarantine and isolation ineffective.

There are several very good reasons just now why this question of communicability should have arisen to much importance in this country, but I do not think they will stand the test of careful examination. In the first place the disease has arisen and grown to large proportions, apparently like the proverbial mushroom, almost in a single night. It is something new, a malady with which we are not familiar, and in some of its manifestations is repulsive, if not actually loathsome; indeed, some of the older writers, evidently struck with this fact, applied to it the name leprosy, a term which, since the days of Moses, has been a synonym to mankind of all that is repulsive and loathsome in human disease. Then, too, it has been associated in our minds very frequently with mental alienation, a state naturally abhorrent to all; and its reported death rate has been very large indeed. Furthermore, the indefinite and pervasive character of its etiology, with the lack, not only of any specific treatment, but the apparent inefficacy of all treatment, has added further color to an already vivid picture.

All these features have given to the disease an air of strangeness, not to say of actual mystery, which has made a strong appeal to the public mind, and which has probably, to a certain extent, reacted upon the professional mind. The result in certain communities has been to produce a very uneasy state of feeling, almost an hysterical condition, at times actually bordering on panic.

This seems very natural, but it is very unfortunate, for an analysis of the situation will not bear out the appearances. Its seeming rapid origin and growth among us is only apparent, but real. While there is evidence of the increasing prevalence of pellagra, there is also undoubted evidence that the disease has existed here for thirty or forty years, and

[3] La Pellagre, Paris, 1903.

[4] Dict. Encyc. des Sc. Med., Pellagre, p. 360-362.

perhaps much longer. During this time many cases have developed, and the present reports of numbers of patients from various sections of the country very probably mean to a great extent the discovery of already existing cases as knowledge widens and skill in diagnosis develops among a profession hitherto largely unfamiliar with the subject. This may seem strange, but is in all likelihood a repetition of what has occurred at other times and in other places where the disease has been recognized for the first time.

Then the disease, in the vast majority of cases, does not present the horrible and revolting aspect so evident in a few; and mental alienation occurs only in a rather small percentage of cases. The mortality, too, is not so large as it would seem to us. We should not forget that our experience is brief and is largely based on asylum cases—the last stage of the most hopeless type of this disease.

Treatment likewise is not so hopeless by any means as it would seem to be, and the absence of any specific treatment for the disease is too common a fact among all diseases to occasion even comment when we must deal with one more in the same class; and, so far as etiology is concerned, the same remark might be made. Our knowledge on this point is just as definite and just as satisfactory as that for scores of other well-known diseases.

Of course the definite question, "Is pellagra contagious or infectious, or even communicable?" cannot receive a categorical negative. To such a question one must of necessity answer, "I do not absolutely know." In considering such a question as quarantine in connection with the disease, while we cannot give such a decided opinion, we can at least say that, from the accumulated observations of other able men with very extensive experience, we regard quarantine as unnecessary and probably unjustifiable.

There are scores and hundreds of observations all going to show that apparently the disease is not a communicable one; and the Italian authorities, who have had such wide experience, and have made so long a struggle with the malady, have not yet, in all their fight for its limitation and eradication, adopted quarantine or isolation measures. Surely if they entertained even the slightest suspicion of its transmissibility from man to man they would not have neglected so important a matter.

I have pehaps said more on this point than it really warrants, but being myself a public health officer, I am too keenly sensible of the hardships induced by quarantine measures willingly to see such procedures adopted when they seem unnecessary.

Quarantine of such cases in one way may do no harm and may be, it can be argued, nothing more than a precautionary means on the side of extreme safety. But surely this is poor reasoning for the adoption of such radical measures. There are in the whole United States how many cases of pellagra? The highest figure would place them at about 5,000. Estimating on the basis that 10 per cent of pellagra patients finally show sufficient mental involvement to enter asylums, this would give us a grand total of some 10,000 to 12,000 cases, the mortality of which we cannot as yet even guess.

When one comes to consider the statistics of other well-known communicable diseases in which quarantine measures are not adopted, the force of this fact can be appreciated. Take typhoid fever, for example. There are probably each year not less than 35,000 deaths in the United States from this affection, which, with the accepted mortality rate of 10 per cent, would mean an annual total of 350,000 cases of this readily communicable disease. Yet such cases are not only not quarantined, but, as one can readily imagine, efficient methods for prevention of this disease are not at all generally applied.

Hookworm disease is another striking example. Doctor Stiles states that there are about 2,000,000 of the Southern rural population infected with this parasite, among whom there is probably, either directly or indirectly, a very high mortality. This is another communicable disease. These cases are not

quarantined, and again no efficient general measures of prophylaxis are in existence.

It is almost a platitude to add tuberculosis, another communicable disease, with its enormous morbidity and mortality. Here again we do not adopt quarantine measures, though we do to some extent adopt isolation.

The real point of all this is, Why should we wish to adopt harsh measures in a disease which, according to all opinion, is not a communicable one when so many other important and communicable diseases are accepted as a matter of course?

Before leaving this point it is desired to be thoroughly understood. I am speaking of pellagra only with regard to its communicability, and what I have said does not minimize in the slightest degree the great importance of pellagra either as a clinical difficulty or as a public health problem. In all likelihood the disease will, according to its nature, steadily increase both in the number of cases affected and in the extent of territory involved. But such considerations as have been noted should not be forgotten lest we lose our sense of due proportion and distort our mental perspective.

Leaving aside this phase of the subject, however, there is another very important question which has a most practical bearing on the prophylaxis of pellagra and which appeals to us all. This question is, What advice shall be given and what measures adopted with regard to the use of corn as an article of diet?

In attempting to answer such a question to our satisfaction we must of course at the outset admit, it seems to me, that our own practical experience with the disease is too brief and too limited to permit our personal observations to have great weight. We are, to a large extent, forced to depend upon the conclusions of others. Moreover, pellagra is not an acute condition, but a very chronic one; and it would seem evident, as many have stated, that it takes not months but years of feeding on spoiled corn before a community begins to develop the disease.

Then, too, while theoreticaly a sharp distinction is drawn between spoiled corn and good corn, yet practically we are confronted with a very real difficulty in trying to determine which is spoiled and which is good corn. Such a distinction, while extremely important, is by no means easy, and the tests for such differentiation are not entirely satisfactory. Good corn is a very valuable cereal, and to advise that the use of all corn be totally suspended is not only impracticable but would seem unnecessary.

These are very practical facts, the full solution of which awaits further efforts; but even now the general distinction betwen good and spoiled corn may, for most purposes, be very fairly determined.

Bearing in mind these considerations, it seems to me that the accumulated work and observations of scores of able men who have had long and extensive experience with pellagra, both as a clinical and a public health problem, should have much weight with us.

Admitting that much of the evidence may seem evasive, unsatisfactory or inconclusive, nevertheless when we take into consideration the generally accepted statement that pellagra was unknown in Europe before the introduction of Indian corn; that it is an epidemic disease confined largely at least, if not exclusively, to populations which grow and eat corn, and more especially to those who, through force of circumstances eat poor grades of corn; that by far the great majority of all thinkers and students believe the disease is, in some definite if at present rather ill-defined way, connected with the use of corn as a foodstuff; that the Italian and other authorities, in all their attempts to limit and eradicate the disease, base their prophylactic measures almost wholly upon this theory, and that as an outcome of such measures good results are claimed—when all these things are given just and due consideration, it seems to me that we must, for the present at least, recognize some relationship betweenn corn and pellagra; and in dealing with a disease of such gravity we must make use of such relationship in our prophylactic measures.

In other words, under such circumstances and conditions, the burden of proof for the present must, it seems to me, rest upon those who deny the influence of corn. Notwithstanding the fact that in the history of medicine the profession has been led into many serious errors through deductions made from false observations, we are in no position now totally to disregard such evidence as is submitted for an etiological relation between corn and pellagra; and in my opinion we must take full cognizance of it in our prophylactic measures, as well as in our curative ones.

Adopting this conclusion, then we might, for our profit, inquire very briefly into the prophylactic measures adopted by other countries, notably Italy, a country which has suffered much from pellagra and has made and is making a determined fight against the disease.

Passing over earlier efforts, the Italian struggle against pellagra has culminated in the law of 1902 for "The prevention and cure of pellagra."* The dispositions of this act are of two kinds—curative and preventive. The former includes such measures as free distribution of salt (a government monopoly in Italy), administration of food either at the homes of the patients or through sanitary stations (*locande sanitarie*), treatment of severe cases in hospitals for pellagrins (*pellagrosarii*) and in insane asylums, etc. With this feature of the bill we are not now concerned.

The prophylactic measures are more numerous, and they are all directed against the use of spoiled corn as an article of food. As Mr. Cutting aptly says, "The cause of pellagra, while scientifically uncertain, is practically, and for Italy, ascertained." The measures comprise, besides a census of the disease and a report of all cases, the testing of corn and meal brought in at the frontiers or offered for sale or brought to the mill, and the prohibition of its sale for food if found spoiled; the exchange of good corn for spoiled corn; dessicating plants; cheap cooperative kitchens; the improvement of agriculture, and the education of the people.

By the provisions of the law all corn is inspected by experts and is submitted to certain tests; if found spoiled, its sale for food is prohibited. The tests are not entirely satisfactory from a scientific standpoint perhaps, but seem sufficient for practical purposes. They include such things as the determination of the proportion of ashes after burning, Gosio's phenolic reaction with ferric chloride, the germination test, and the general physical properties of the grain, such as appearance, smell and taste.

The weak point in the inspection of corn seems to be in dealing with home-grown corn, especially the meal, either at the mill or on the markets. There seems to be no solution of this difficulty except governmental ownership of the mills, and this proposal is supported by many.

The *cattedre ambulante* (moving chairs), or "farmers' institutes," are of much importance in educating the farmers in agricultural methods, and these institutions have contributed a great deal to agricultural progress in Italy in the last few years. In regard to corn they teach the use of better varieties, proper methods of culture, etc., or how to supplant corn entirely with a more profitable crop.

The disiccating plants for the artificial drying of corn is considered a very important prophylactic measure, as it prevents the spoiling of the grain. These desiccators are of two types, fixed and portable, and there are a large number of public desiccators throughout Italy. There is also a provision in the law for public storehouses, properly constructed, where the grain may be stored under the best conditions to prevent spoiling.

Rural bakeries (*forni rurali*) and economic kitchens (*cucine economiche*) are establishments where an effort is made to eliminate from the peasant's diet any bread made of

*For information regarding this law and its application I am very much indebted to an official unpublished report on pellagra by W. Bayard Cutting, Jr., at one time American vice-consul at Milan, Italy. I have made very free use of this excellent report.

corn, by supplying good wheat bread and other food at a low cost.

The corn exchanges are devoted to the exchange, under certain conditions, of good meal for poor corn, to prevent the peasants eating the spoiled grain.

There are many other agencies used in the fight against pellagra, but these will give an idea of the general scope of such a struggle.

Above all such work as this, however, stands the education of the people to the dangers of spoiled corn and the healthfulness of a varied diet and better living conditions. A great deal has been done in this way; popular pamphlets are distributed, popular lectures are held everywhere, the school children are taught the dangers of spoiled corn, and the pellagrologic and the agricultural commissions of the different provinces are indefatigable in their propaganda against the spoiled grain.

The results of such work, only a brief sketch of which has been given, seem on the whole very encouraging, but their interpretation is difficult by reason of other contemporaneous developments. They coincide with a marked rise in general prosperity. The laborers and peasants now can eat better food than ever before; numbers of the rural population are employed in industrial institutions, where they receive a varied diet; temporary emigration has reflexly widened the view of the peasant class, and they demand and get better food and living conditions; the consumption of meat is increasing, and wages are higher. Such things must, of course, in a disease like pellagra, have a very profound effect.

Statistics, as may be seen from the following figures,* undoubtedly show a decrease in pellagra:

Total Number of Pellagrins in Italy, by Census.

1879	97,855
1881	104,067
1899	72,603
1905	55,029

Total Deaths from Pellagra in Italy.

1898	3,987
1900	3,788
1904	2,363
1906	439
1907	376

For many reasons, statistics are not entirely satisfactory and do not serve to show the actual state of the case. The opinions of those actively engaged in the work and in close touch with the situation, however, are in general that pelagra in Italy is notably decreasing both in numbers and in intensity. Strange as it may seem, however, the disease is increasing its area, and parts of Italy previously free from pellagra are now developing the disease. The cause of this is not apparent.

In conclusion, it seems to me we may say that there is no evidence that pellagra is a communicable disease, and quarantine measures, in the present state of our knowledge, would appear unnecessary; that, unless we can disprove it, we must for the time at least accept the existence of some connection between corn and pellagra, and in our efforts at prophylaxis we must take coxnizance of the alleged effect of the use of this grain as human food; that our own experience is too limited and too brief for us to base on our own observations as yet any new theories as to etiology; and that we cannot afford, either with regard to etiology or to prophylaxis, to reject the observations and deductions of those who have had a far wider and fuller experience than ourselves.

*Cutting, loc. cit., and Wollenberg, Public Health Reports, July 23, 1909.

HOOKWORM DISEASE IN ITS RELATION TO THE NEGRO*

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During the last seven years considerable literature has appeared in regard to hookworm disease in the United States, but nearly all of these articles treat of the malady as found in the white race. The present paper is prepared with special reference and relation to the negro.

CAUSE OF HOOKWORM DISEASE.

Hookworm disease is caused by the presence of small worms belonging to a group of roundworms known technically as *Uncinariinae*. Two different kinds of hookworms occur in man. One of these is known popularly as the "Old World hookworm," the other as the "New World hookworm." Both of these parasites are known to occur in Africa, the home of the negro, and both have been found in the negro. The Old World hookworm is relatively rare in the United States, where the great majority of cases of infection must be attributed to the New World parasite.

The New World hookworm is known technically as *Necator americanus*, which means "the American murderer." This name was given to it because of the great number of deaths it causes, directly or indirectly. It is about one-fourth to one-half an inch long and about as thick as a small hairpin. It has hard cutting plates or jaws guarding the entrance to its mouth, with the aid of which the parasite fastens to the intestinal wall.

WHERE THE HOOKWORM LIVES.

In its adult stage the hookworm is found fastened to the lining membrane of the small intestine. It is also sometimes found in the stomach. It makes a wound, sucks the blood, and produces a poisonous substance which injures the person infected.

A person may harbor a few hookworms, or several hundreds, or several thousands, according to the amount of infection to which he has been subjected. As children are usually subject to infection more than are adults, the disease is usually more common in them.

HOW THE HOOKWORM DEVELOPS.

These parasites do not multiply in the intestine, as their eggs require oxygen in order to develop. It is important to recall that for every hookworm found in the bowels a separate germ (young worm) must enter the body.

The parasites in the bowels lay hundreds of eggs which are discharged by the patients in their stools. An ordinary stool from an infected person may contain thousands upon thousands of these eggs. This is an exceedingly important point to remember, for it is only through the discharges from the bowels that these eggs escape from the patients, and if all such discharges are properly disposed of hookworm disease can be stamped out of existence.

A few hours after the eggs are passed by the patient a young embryo develops in the egg and escapes from the egg shell. This tiny worm, which is scarcely visible to the naked eye, feeds for a few days. Within about a week it sheds its skin twice, in somewhat the same way that a snake sheds its skin.

*Reprint No. 36 from the Public Health Reports, Vol. XXIV.

It now continues to live in the cast-off skin, but it takes no more food until it enters a person.

HOW THE HOOKWORM ENTERS HUMAN BEINGS.

The young worm may enter persons in two different ways. First, it may be swallowed in contaminated water or food. Secondly, it may bore its way through the skin. This second method of infection is doubtless the more common. The young hookworms in boring through the skin produce an attack of "ground itch" (also known as "foot itch," "footsore," "dew itch," "dew poison," etc.). *Thus "ground itch" is usually the first stage of hookworm disease.* It is quite generally believed that the wearing of shoes will prevent ground itch, and this popular belief is correct to a great extent, namely, so far as ground itch on the feet is concerned; wearing shoes will therefore *reduce* but not *eradicate* hookworm disease.

After entering the skin, these young worms make their way to the blood, and pass with the blood through the heart to the lungs. From the lungs the parasites pass up the windpipe, down the gullet, through the stomach, to the small bowels, where they gradually shed their skin two more times, become mature, and then begin their work of injuring the walls of the intestine, of sucking the blood, and of poisoning their victims.

FACTORS FAVORING HOOKWORM DISEASE.

There are certain factors which are especially favorable to the development of these parasites.

Climate.—Climate has an important influence on these worms. The hookworms which infest man require a certain amount of warmth in order to develop and on this account they thrive better in the South than in the North. Therefore, generally speaking, this disease is a tropical and subtropical malady. In the United States it is a southern disease, and its occurrence north of Maryland is exceptional. For practical purposes, we may say that the Potomac and the Ohio rivers form about the natural northern limit of its distribution, although some few cases do occur north of these streams.

Soil.—A loose soil, such as a sandy soil, is much more favorable to the development of the worms than is a hard, compact soil, such as clay.

Moisture and shade.—As the drying action of the sun is usually fatal to the worms when on the ground, shaded and moist localities are more favorable to the disease than are unshaded and dry localities.

SOIL POLLUTION.

It has been stated in the foregoing that the only way by which the hook worms' eggs escape from the patients is through the stools. As this is also the usual method by which the typhoid germs escape, it is seen that careless disposal of the body waste is favorable to the spread of both of these maladies. The contamination of the ground with disease germs is known as "soil pollution," and other things being equal, hookworm disease will increase in frequency as soil pollution increases, and will decrease as soil pollution decreases.

Exact studies have not as yet been conducted in this country covering any great area in regard to the percentage of negroes infected with hookworm disease as compared with the white race in the same localities, but it is thoroughly established that hookworm disease does occur in the negro as well as in the white, and that in some countries it is especially common in the negro. The comparative statistics thus far available for Georgia and Florida show (in accord with what theory demands) that in our Southern States also hookworm disease is more common in the negroes than in the whites.

An examination of several hundred farms in North and South Carolina, Georgia, and Alabama shows that of the farms having no privies twice as many are occupied by negroes as by whites. This would indicate the negro to be a much more frequent soil polluter, and if he is infected with hookworm disease in equal proportion to the white race he will, because of his more frequent pollution of the soil,

be a greater factor in the spread of the disease to others and its general dissemination throughout the community.

The effects of hookworm disease may be divided into the *direct* effects and *indirect* effects.

Direct effects.—Under the direct effects of this disease we may include the symptoms and deaths due directly to the infection. My experience has been chiefly among the whites, and, in comparison, only to a limited extent among the negroes. Thus far I am persuaded that in reference to symptoms this infection is more severe on the white race than on the negro race, and this experience is in harmony with the observations of other workers. To put it into technical language, the negro (when compared with the white) presents a *relative immunity* to the direct effects of hookworm infection. This observation carries with it a very important thought, namely, that probably the negro race has had this disease for so many generations in Africa that it has become somewhat accustomed to it. This thought may be a very comforting one to the negro from one point of view, but from another viewpoint it must be decidedly disquieting to the white race, for it carries with it the thought that on an average in the rural districts from the Potomac to the Gulf the 833 negroes to the 1,000 whites (found in eight States) represent *theoretically* 833 possible hookworm reservoirs who do not suffer so seriously from the direct effects of the malady, who are therefor not so likely to come under treatment, but who are likely to act as spreaders of the disease to the rest of the community; it also possibly indicates that the negro has brought hookworm disease with him from Africa and because of his soil pollution has spread it broadcast through the South, thereby killing thousands and causing serious disease among tens of thousands of others.

Whether this line of thought be considered justified or not, we must all frankly face the fact that the negro does have hookworm infection, and because of his insanitary habit of polluting the soil, especially in rural communities, his presence is a menace to others not only in respect to hookworm disease, but also in respect to all other diseases spread by soil pollution.

In severe infections the patients may be underdeveloped both physically and mentally; they present an anaemia (often mistaken for malaria); the skin may be dry and tallow like; the hair is dry;; the shoulder blades are often very prominent and the abdomen is frequently swollen ("pot-belly"); there is usually a tenderness in the pit of the stomach; in about half of the severe cases there are (or have been) ulcers on the shins; in about 90 per cent of the cases the patients have had "ground itch;" the hair in the armpits and on the pubis is frequently very scanty. Hookworm disease is the most frequent cause of "dirt eating." It is also the most common cause of anaemia found among farm and cotton-mill hands in the South. The patients are weak, and this weakness brings with it an indisposition to work, frequently interpreted as "laziness."

Indirect effects.—As this infection injures the intestinal wall, brings about an inestinal catarrh, and thus interferes with the digestion, it naturally increases the chances of death in case a person is infected at the same time with some other disease in which good nourishment is important for recovery. As hookworm infection decreases the number of red blood corpuscles, it also increases the chances of death in case a person is infected at the same time with some other disease in which a good supply of oxygen to the tissues is important for recovery. Since good nourishment and proper functioning of the blood are two of the most important factors in recovering from pulmonary tuberculosis (known commonly as consumption), it is to be expected that persons who have both tuberculosis and hookworm disease will stand less chance of recovery than will persons who have consumption but not hookworm disease. *In other words, hookworm infection has an indirect effect in increasing the death rate from pulmonary tuber-*

culosis. It has been estimated that it about doubles the chances for death in cases of this disease. Now, even admitting that the direct effects of hookworm infection on the negro are less than on the white, it is a suggestive combination of facts that the tuberculosis death rate is about three times as great in the negro as in the white (namely, 490.6 to 173.5 per 100,000).

It is evident, therefore, that the eradication of hookworm disease is of great importance to the negro in his fight against tuberculosis.

Quite recently some very important observations have been made in Manila upon the indirect effects of hookworm infection. When the Americans took charge of Bilibid prison the death rate was 238 per 1,000 per year; by improving the sanitary conditions this death rate was reduced to about 75 per 1,000; here it remained stationary until it was discovered that a very high percentage of the prisoners were infected with hookworms and other parasites; then a systematic campaign was inaugurated to expel these worms, and when this was done the death rate fell to 13.5 per 1,000.

Although the death rate among our American negroes has not as yet been reduced in a similar way, it cannot be doubted that a reduction of their hookworm infection would result in a reduction of their general death rate (from all causes), which, when compared with the death rate of the whites, is in the ratio of 29.6 to 17.3 per 1,000 per year for the registration area.

NEGRO EDUCATION AND HOOKWORM DISEASE.

Hookworm disease has a serious effect upon the mind and prevents children from fully and properly assimilating the education which the country is offering them. Hookworm children are apt to study and learn with difficulty. As I visit the country schools and pick out the children suffering from this malady, the teachers generally exclaim: "Why, doctor, you have picked out the most stupid children in the class!" That same mental handicap which this disease places upon the white children seems also to rest upon the negro children, although, as already stated, my observations among the negroes are much less extensive than among the whites.

The point to be made is this: Because of the effects which this infection has upon the mind, the present soil pollution (which spreads the disease) so prevalent among the negroes is necessarily resulting in a severe handicap in the mental advancement of the negro chidlren.

As nearly as can be estimated (admittedly a rough estimate), the physical condition of the southern country school children with whom I come in contact is such that they cannot possibly assimilate much over 70 per cent of the education they receive; in other words, somewhere about 30 per cent of the educational efforts are wasted, and prominent southern educators have stated that this estimate is very conservative. It may be stated that many of the country schools and country churches are breeding places for disease, and whatever they may do for education and religion *they are in their present insanitary condition a menace to public health;* a large number of the country schoolhouses and country churches are not provided with any privy, and children congregating at the schools by polluting the soil may spread disease to one another.

TREATMENT OF HOOKWORM DISEASE.

Treatment of this malady should be conducted under the personal direction of a physician, as the size of the dose of thymol to be given depends upon the physical condition of the patient. Every person who has the infection, rious or any effects, owes it to his fellow-men even if it is so light that he does not feel se- to undergo treatment. The treatment is not expensive, and can be carried out without losing time from work.

PREVENTION OF HOOKWORM DISEASE.

All persons, whether infected or not, but living in the infected area, can aid in preventing this malady. *The most important point involved is to prevent soil pollution.* As stated in the foregoing, *because of the absence of privies* many farms, schools, and churches are

acting as a medium for soil pollution, resulting in hookworm disease and certain other maladies.

If there is a sewer present, it is best to construct a water-closet and connect it with the sewer. If there is no sewer, the next best thing is to construct a septic tank and a water-closet. There are many who cannot afford to have a water-closet with septic tank, and under these circumstances the next best thing to do is to construct a sanitary privy and to clean it regularly. The following are the chief features of one type of this important outhouse: There should be a good floor extending under the seat as well as under the front part; a water-tight tub or barrel or galvanized pail is placed under the seat; on the bottom, inside of this receptacle, is placed a thin layer of sand or dirt each time it is emptied; the tub should be filled about one-fourth full with a 5 per cent crude carbolic-acid solution (1 part of crude carbolic acid to 19 parts of water); if economy is an important point, the tub may be filled one-fourth full of water and a cup of kerosene poured on the water, but if kerosene is used care should be taken not to throw any lighted matches into the tub; the back of the privy is provided with a hinged door, which is opened only in order to remove the tub for cleaning, while at other times it should be closed tightly in order to keep out flies and animals; the seat should be provided with hinged covers; the front door should be hinged so that it will close well, to keep out the rain; it is a good plan to place a ventilator in the roof, also one on each side near the roof, and one each side of the tub; it is desirable to screen with wire netting all of these ventilators, in order to aid in keeping out the flies.

The tub should be cleaned regularly, once or twice a week; the night soil should be burned or buried; if buried, this should not be done within 300 feet of any well, creek, spring, or other water supply. Under no circumstances should the night soil be used as top dressing on the gardens; if used at all for fertilizing purposes, it should first be allowed thoroughly to ferment, preferably in a vat, and then it should be plowed under in fields far removed from the house! while fermenting, a cup of kerosene oil should be poured into the vat in order to keep flies away; it is dangerous to dump the night soil on the manure pile, as flies breed in the manure, and if the night soil is mixed in, the flies may carry fecal material to the kitchen or dining room and infect the food with filth and with disease germs.

Still another plan is to build a vault under the privy. If this is done, it is well to pour a cup full of kerosene oil into the vault occasionally in order to repel flies.

The average privy found in the South is known as a "surface" or "dirt" privy, and is a very poor substitute for a water-closet, as it permits soil pollution.

Whatever style of closet is selected or whatever fluid is used, the chief points to be held in mind are: Prevent soil pollution; so protect the night soil that flies and other insects cannot breed in it or feed upon it; and keep it out of the reach of animals of all kinds.

It lies within the power of preachers and teachers to play a very important role in reducing the death rate. They are the persons to whom many people look to set the example. If preachers and teachers themselves permit the yards of churches and schools to be defiled by soil pollution, it need not be thought strange if farmers permit soil pollution to occur around the homes. Further, it should be recalled that every church and every school around which soil pollution is permitted to occur may act as a disease-breeding center from which infection can be spread to the farms and homes. Further, also, not only can preachers and teachers do good by setting an example in preventing soil pollution, but if they will point out to their friends the dangers which this pernicious habit carries with it, they can be very important factors in inducing the public to institute more sanitary customs, and thereby they can be important factors in reducing the death rate.

EDITORIAL

THE ROCKEFELLER GIFT FOR THE PURPOSE OF FIGHTING HOOK-WORM DISEASE IN THE SOUTH.

We have noted with great surprise, and we may say sincere regret, the opposition of a few newspapers and one or two laymen of more or less reputation to this generous offer, the acceptance of which means so much in a life-saving crusade against a disease which not only prevents the physical development and usefulness of the laboring classes, among which it is especially prevalent, but renders their mental development so defective that they are incapable of receiving the ordinary rudiments of an education, thereby rendering them unfit for any useful occupation.

The causes leading up to this disease, together with its well known methods of gaining entrance into the human body, make it peculiarly preventable by the expenditure of money in the improvement of the sanitary life of these people who, from their poverty and their inability to help themselves, are the proper subjects for charitable and philanthropic gifts.

While the writer is intensely Southern, by birth and education, and would not yield to any man in his loyalty to the section of country that gave him birth, yet he cannot but feel that the half centruy which has elapsed since the Civil War and the reuniting of the sections of the country above and below the Mason and Dixon line should make every man proud of this union, proud of American institutions, and rejoiced in the fact that this is one united country with the same interests and a common destiny, rather than take the contracted and narrow view that a good impulse from one of our brothers in the North is reflective and should be resented, especially when it has for its object the eradication of a scourge of such destructive power among a people who are helpless in their ignorance and poverty, wherever their dwelling place may be. In fact, such gifts are but further demonstrations of the proper citizenship of this country and should be received and conscientiously applied for the purposes suggested by their donors who thus give expression in a most substantial way to the fact that we are our brother's keeper, and that misery and human suffering in any part of our country deserve active assistance in their eradication from any source and any section of our common country without cant, bigotry, or narrow-minded sectionalism.

Some writers have not been satisfied in the exposure of their own littleness in antagonizing this great and magnanimous gift, but have even insinuated that the medical profession are in favor of it for mercenary purposes. To all such we will not reply, feeling a sincere pity for any man who is either so narrow-minded, or so venal as to charge a great profession, whose whole lives are spent in the preservation of the health of the people, with having such base motives.

We have noticed these criticisms because we do not believe they represent the Southern people. In fact, a small minority will be found who endorse these criticisms of Mr. Rockefeller, the large majority of broad-minded, thinking people of the South being in favor of accepting his generous offer in the same frank, Christian spirit in which it was made; and we would close by not only thanking him, but with a solemn prayer that more men will show the same broad, practical charity in this fight on disease and sickness wherever found. We sincerely hope that the Southland that has suffered so much may

sometime come into its own and be delivered from the narrow-minded, so-called friends who have so long retarded her development.

CORRECTION.

The editor-in-chief has received a correction from our good friend, Dr. Jno. B. Cranmer, calling his attention to a mistake in an editorial on hookworm disease in the October number, where it was stated that the thymol should be followed by a brisk purge of either saline or castor oil. Of course the solubility of thymol in any oil would make the giving of castor oil, following the administration of thymol, improper and dangerous, and we sincerely thank our good friend for calling our attention to the unintentional error.

The facts are: in the hurry of dictating the editorial the mistake was made in the following way: It was the intention of the writer to suggest a large dose of castor oil the day before the administration of the thymol, and after the giving of the thymol the saline purgative should follow.

We hope our readers will note this correction, and we desire to state that any suggestions or corrections from our readers, made with the motives of Dr. Cranmer, are not only highly appreciated, but invited.

ASSOCIATION MEETING

The Twenty-second Annual Session of the Southern Surgical and Gynecological Association will be held in Hot Springs, Va., December 14, 15, 16, 1909. The headquarters of the meeting will be at the Hot Springs Hotel. All communications should be addressed to Dr. W. D. Haggard, Secretary, 148 Eighth Avenue, Nashville, Tenn.

The preliminary program is as follows:

Presidential Address. "Latent and Active Neurestheni a in its Relation to Surgery," Dr. Stuart McGuire, Richmond, Va.

"A Brief Discussion of Some of the Surgical Junk Demanding Further Surgical Interference," Dr. Joseph Price, Philadelphia, Pa.

"Adhesion of Sigmoid to Tube and Broad Ligament as a Cause of Pain in Salpingitis," Dr. H. A. Royster, Raleigh, N. C.

"The Treatment of Extra-uterine Pregnancy," Dr. Reuben Peterson, Ann Arbor, Mich.

"Puerperal Thrombo-phlebitis of the Pelvic Veins," Dr. Willard Bartlett, St. Louis, Mo.

"Advantages of Neglect in Appendicitis Operations," Dr. Robert T. Morris, New York, N. Y.

An Unusual Type of Bladder Tumor," Dr. Robert C. Bryan, Richmond, Va.

"Cases of Fibroid Induration of the Corpus Cavernosum; also a Case of Maydl Operation for Exstrophy of the Bladder," Dr. H. J. Whitacre, Cincinnati, Ohio.

"The Principle of the Taele Flap Applied to Amputation of the Penis," Dr. Wm. M. Mastin, Mobile, Ala.

"Some Remarks upon the Surgery of the Knee Joint," Dr. J. Garland Sherill, Louisville, Ky.

Ossifying Sub-periosteal Haematoma (Myositis Ossificans)," Dr. J. M. T. Finney', Baltimore, Md.

"The Necessity for Cholecyst-duodenostomy," Dr. LeGrand Guerry, Columbia, S. C.

"Some Recent Observations on Surgery of the Pancreas, with the Report of a Case of Multiple Neuritis Associated with Pancreatic Abscesses, Dr. Joseph C. Bloodgood, Baltimore, Md.

"Pancreato-Enterostomy," Dr. R. C. Coffey, Portland, Ore.

"Increase in Cancer," Dr. W. B. Coley, New York, N. Y.

"The Surgical Treatment of Radically Inoperable Carcinoma," Dr. Chas. M. Rosser, Dallas, Texas.

"Traumatic Amputation of the Cervix at Delivery," Dr. Chas. R. Robins, Richmond, Va.

"The Railroad Spine," Dr. Robert Carothers, Cincinnati, Ohio.

"Anatomic, Pathological and Clinical Studies of Lesions Involving the Appendix and Right Ureter, with Special Reference to Diagnosis and Operative Treatment," Drs. John Young Brown and Wm. Engelbach (by invitation), St. Louis.

"The Diagnosis of Hyperthyroidism or Exophthalmic Goiter," Dr. C. H. Mayo, Rochester, Minn.

"Skin Grafting," Dr. A. C. Scott, Temple, Texas.

"Circumscribed Serous Spinal Meningitis," Dr. John C. Munro, Boston, Mass.

"The Use of the Rubber Dam in the Technique of Gastroenterostomy, Intestinal Antastomosis, etc.," Dr. Geo. H. Noble, Atlanta, Ga.

(1) "Complete Excision of the Shaft of the Tibia and Transplantation of the Fibula to Replace It;" (2) "A Case of Nerve Suture by Foramitti's 'Tubular' Method," Dr. Gaston Torrence, Birmingham, Ala.

"Suture of the Recurrent Laryngeal Nerve, with Report of a Case," Dr. J. Shelton Horsley, Richmond, Va.

"Results in Surgery of the Peripheral Nerves," Dr. J. B. Murphy, Chicago, Ill.

"Treatment of Wounds of the Heart, with Report of Two Cases," Dr. Walter C. G. Kirchner, St. Louis, Mo.

"Hypernephromata (illustrated with lantern slides)," Dr. Louis B. Wilson (by invitation), Rochester, Minn.

"Leaving Foreign Bodies in Operative Wounds," Dr. Maurice H. Richardson, Boston, Mass.

"An Operation for Congenital Deficiency of the Vagina. Report of Three Successful Cases," Dr. Alex Hugh Ferguson, Chicago, Ill.

"Clinical and Experimental Research into Nitrous Oxid and Ether Anaesthesia," Dr. G. W. Crile, Cleveland, Ohio.

"Successful Enucleation of a Tumor from the Motor Cortex," Dr. Stephen A. Watts, Charlottesville, Va.

(1) "Further Report on the Surgical Treatment of Epilepsy;" (2) "Some Interesting Facts in Brain Surgery," Dr. W. P. Carr, Washington, D. C.

"The Treatment of Shock," Dr. J. G. Earnest, Atlanta, Ga.

"The Symptoms and Ultimate Treatment of Hydatidiform Degeneration of the Chorion, with Report of Case," Dr. J. Ernest Stokes, Salisbury, N. C.

"Acute Abdominal Conditions in Infants," Dr. Randolph Winslow, Baltimore, Md.

"Acute Gastro-Mesenteric Ileus, following Operation for Ulcer of the Stomach," Dr. T. C. Witherspoon, Butte, Mont.

"Perforation and Rupture of the Gall Bladder," Dr. F. T. Meriwether, Asheville, N. C.

"The Prophylactic Flaps and Principles of Prosthesis in Amputations," Dr. G. Wiley Broome, St. Louis, Mo.

"The Perforation of the Appendix by Round Worm, with Report of a Case," Dr. J. E. Cannady, Charleston, W. Va.

"Iodine Sterilization of the Skin," Dr. I. S. Stone, Washington, D. C.

Title to be sent later, Dr. J. W. Bovee, Washington, D. C.

Title to be sent later, Louis Frank, Louisville, Ky.

Title to be sent later, John B. Deaver, Philadelphia, Pa.

Title to be sent later, C. Jeff Miller, New Orleans, La.

Title to be sent later, Joseph Ransohoff, Cincinnati, Ohio.

Title to be sent later, Herman Tuholske, St. Louis, Mo.

BOOKS

BOOKS RECEIVED.

Causes of Disability. By Dr. Charles H. Harbaugh, M.D., Medical Director for the American Assurance Company, Ex-President of the American Association of Medical Examiners. Octavo of 650 pages, with 142 illustrations, 20 in colors. Philadelphia: Overbrook Publishing Company, 1909. Cloth, $6.00 net. The Overbrook Publishing Company, 533 North Sixty-third Street, Philadelphia.

The Diseases of Children. By Henry Enos Tuley, M.D., Professor of Obstetrics, University of Louisville, Louisville, Ky. 653 pages. Published by the Baltimore Southern Medical Publishing Company, Baltimore, Md.

Diseases of Infants and Children. By Henry Dwight Chapin, A.M., M.D., Professor of Diseases of Children, New York Post Graduate Medical School and Hospital, New York City; and Godfrey Roger Pisek, M.D., Professor of Diseases of Children, University of Vermont. Contains 610 pages with 179 illustrations and eleven colored plates. Price, $4.50 net. Published by Messrs. William Wood & Company, 51 Fifth Avenue, New York City.

The 1910 *Medical Record Visiting List.* Published by William Wood & Company, New York. Prices, $2.50 to $4.00.

New and Nonofficial Remedies, 1909. Containing descriptions of the articles which have been accepted by the Council of Pharmacy and Chemistry of the American Medical Association prior to January 1, 1909. Published by the American Medical Association, 103 Dearborn Avenue, Chicago.

The Propaganda for Reform in Proprietary Medicines. Published by the American Medical Association. 103 Dearborn Avenue, Chicago, Ill.

Transactions of the Medical Association of the State of Alabama, 1909. Published by the Brown Printing Co., Montgomery, Ala.

BOOKS REVIEWED.

Diseases of the Skin—an Outline of the Principles and Practice of Dermatology. By Sir Malcolm Morris, K. C. V. O. Published by Wm. Wood & Co., New York.

The book under review is the fourth edition of this work by Sir Malcolm Morris. Any work coming from this author is to be considered of the very highest type. While the book is not so large—662 pages—it sets forth in a clear-cut, concise way the up-to-date Principles and Practice of Dermatology, with many helpful cuts and illustrations. It is the product of a long and successful service in the practice of dermatology, and is to be highly recommended. J. M. K.

American Pocket Medical Dictionary. Edited by W. A. Newman Dorland, A.M., M.D., containing the pronunciation and definition of all the principle medical terms along with 60 extensive tables, and published by W. B. Saunders Co., Philadelphia, Pa.

This sixth edition should need no review or introduction to the physicians and medical students of this country. It is as complete as a *pocket* edition can very well be made. The value of such a complete and convenient sized book cannot be estimated. I subjected it to a rather severe test, but found the recent medical terms present and defined. The book is reliable, and is to be highly recommended.

J. M. K.

Synopsis of Surgery. By Ernest W. Hay Groves. Published by William Wood & Co.

Is a small volume of 480 pages, giving excellently, as the title would indicate, a synopsis of surgery up to July, 1908. It is written by a teacher, which is favorable, inasmuch as of all men they who teach must keep abreast of advances made in their respective departments. It is arranged and more or less founded on the

excellent text of Rose and Carless, a guarantee that the work is accurate and scientific. For students it cannot fail to be of marked value in their reviews, though not as a text. This is not its purpose. If, however, he has used one of the standard texts, especially Rose and Carless, he will find it of great value in review. The physician wishes to keep abreast of surgical progress; he cannot if dependent upon the vast literature published, and often must use a text in dealing with his minor and border line cases that is years out of date. Groves' book will bring him to date and give an insight into the advances made, so valuable in many cases coming into daily practice. The intention of the author is admirably accomplished, and I know of no review so easy, so valuable to those who cannot devote their whole time to the study of surgery.

W. A. BRYAN.

Bier's Hyperemic Treatment. By Dr. Willy Meyer and Dr. Victor Schneider. W. B. Saunders & Co.

Is now in its second edition, after most flattering sales of the first edition. The text has been revised, case histories introduced, and an index to the world literature has been appended. The results gained in the practice of all who have used this powerful theropeutic agent, must compel all to admit its widespread usefulness. Those who have not used it are failing necessarily in the cure of many cases needlessly, or delaying others unduly. To read the text will convince the most skeptical of the value and perhaps will change his ideas in a most wholesome way from looking upon inflammation as a pathological enemy to considering it a natural remedial agent which may be reenforced by proper understanding of Bier's methods. It will further elucidate the value of many of the former empirical methods of treatment. No library is complete without this work, and no physician in whatever line of work is dealing quite safely to remain ignorant of its contents. W. A. B.

State Board Questions and Answers. Goepp. Published by W. B. Saunders Co.

Is a systematic arrangement of questions, with answers, given by the various state examining boards. Elimination of certain unsuitable questions propounded by the boards, and avoidance of repetiton, have been carefully observed. The text covers the subject matter of the questions asked in the past, with no effort to attribute them to the particular board giving them, but arranging the whole on a scientific basis, and grouping them under the various departments to which they belong, and arranged under the following titles: Physics, Chemistry, Physiology, Anatomy, Hygiene, Materia Medica and Therapeutics, Practice of Medicine, Surgery, Obstetrics, Gynecology, and Pathology. As the author states in his preface, a few obvious questions have been interpolated to maintain the continuity of the subject. Most new graduates desire to know what state examinations are like, while physicians long in practice may from change of location, be placed in the same position; and both may desire to review fundamentals or branches in which their practice or study has been limited. They desire to know what the state boards expect of them. Goepp answers that question in the best, the only possible way, by giving and answering, as fully as the boards of examiners would expect, often more so, the questions put to applicants in the past.

Thus Questions and Answers becomes therefore a compend on the subjects inquired into by the state examiners, offering in condensed form what the elaborate treatises give in detail, to which attention is invited by the author when the limits of space have compelled shorter answers, than the question might demand.

The work is thoroughly indexed, which in a work of the kind becomes one of its most valued features. W. A. B.

ABSTRACTS OF CURRENT LITERATURE

PERSISTENT THORACIC SINUS.

C. N. Dowd, New York (*Journal A. M. A.*, October 16), has performed the operation of lung decortication connected with thoracoplasty in fifteen cases in children and describes the condition and changes calling for the treatment, his method of operation and the means of avoiding its necessity. In his patients ether was used, the patient lying on the sound side. The operation proceeded as follows: "'Orientation' incision was made about the sinus opening with resection of 3 or 4 inches of the rib above and the one below it. The incision was then carried upward in anterior axillary line to the third rib. The ribs were divided and suitable portions removed, usually one-half inch from the second or third, 4 to 6 inches from the tenth, and corresponding pieces from the intermediate ones. Sometimes less was taken away. With suitable retraction an excellent view of the sinus is thus obtained. A longitudinal incision is then made through the upper part of the sinus wall until the lung is reached. At this stage of the procedure the patient is allowed so nearly to emerge from the anesthesia that he will cough, when the lung usually bulges into the incision. The membrane is then separated from its surface over as large an area as is practicable and removed. In most of these cases a strip 2 or 3 inches long and from 1 to 2½ inches wide has been removed. This about represents the pulmonary portion of the sinus lining. The chest wall was nearly brought together by strong sutures and a drain or suction tube inserted in the unclosed part." The amount of chest wall removed varied according to the case and according to the likelihood of gaining lung expansion. In every case persistent and continued blowing on James' (or Wolff's) bottle has been used, and he thinks the expansive power accompanying this method is very great. The results are very encouraging, twelve of the fifteen being perfectly well, with varying degrees of chest expansion and capacity, and without lateral curvature of the spine. One patient is still in the hospital, one died of tuberculosis, and one was removed while doing reasonably well two days after the operation, and died a few days later in insanitary tenement surroundings. By prompt relief of pyothorax before lung compression takes place, is the best method of avoiding these sinuses. The author's deductions from this group of cases so far as he thinks they can be justified are, "1. Persistent thoracic sinus can be cured by decortication of the lung and resection of the chest wall in 80 to 90 per cent of the cases. 2. After operation the patient will not have lateral curvature of the spine. 3. The lung capacity on the affected side will remain much diminished. 4. Nearly all the patients are in good health and are not materially inconvenienced by this restricted lung capacity. 5. The mortality from the operation is probably more than 5 per cent and less than 10 per cent." The article is fully illustrated.

The Alteration Caused by Injections of Gray Oil. Pellier, *Ann. de demal. et de syph*, 1909, X, Nos. 4 and 5, pp. 294-307.

The author has had an opportunity to study the question from the body of a young woman who had received five injections and died four days after the last one. Not more than two or three such cases have been observed, so for this reason much value is attached to Pellier's article.

The lesion produced by gray oil in muscular tissue differs from that made in connective tissue, though the absorption and resolution in

sclerosis are somewhat similar, except the absorption is much more rapid in muscular.

The mercury is found either in droplets or in a combined form, the droplets varying in size, probably depending upon the fineness of the emulsion used. The droplets disappear in ten days. In connective tissue the same changes take place, but later.

The combined mercury appears as black granulations, and their mercurial nature is confirmed by the finding of droplets showing a graded series of changes from the center to the periphery. This refutes the opinion of some writers, who consider these black granulations as coming from the oily menstruum.

The fresh lesion in the muscular tissue shows a hemorrhage, which appears under two forms: First, masses of red cells; second, large deposits of fibrinous material, containing spaces and showing a tendency to organize into granulation tissue. The spaces often contain metallic mercury. The spaces are nearly always found, but their origin is doubtful.

The muscle fibres degenerate, and there is a marked reaction of the connective tissue cells around the central clot, with a tendency to fibrous organization.

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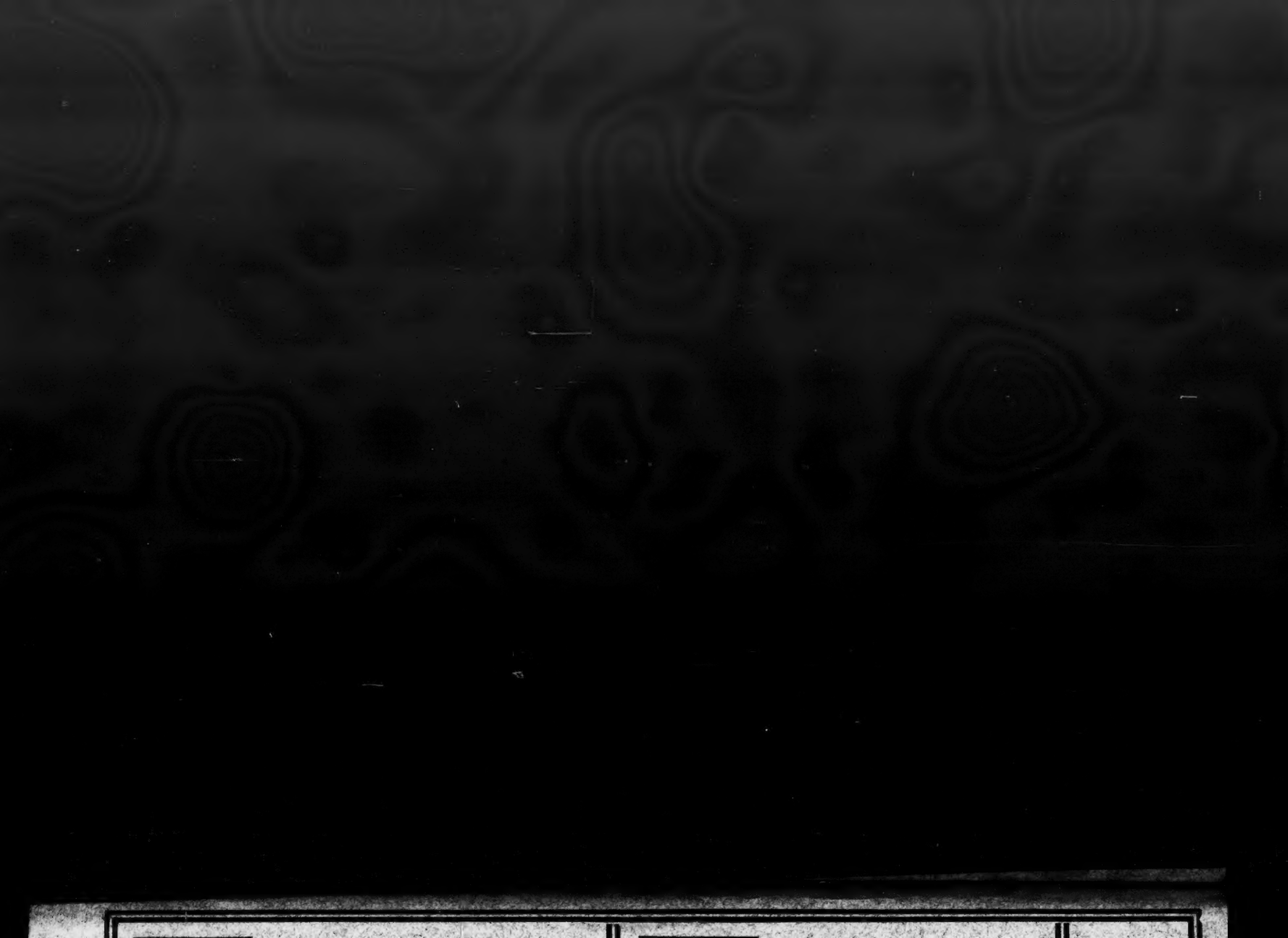
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